

# AMERICAN RAILROAD JOURNAL.

## STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

### HENRY V. POOR, Editor.

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#### American Railroad Journal.

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Saturday, July 26, 1851.

#### The Britannia Bridge.

We have frequently given detached sketches of this great work, so interesting to scientific men, and engineers. We now present a pretty full account of its construction, together with the various experiments that led to the adoption of the form of tube used, compiled from a history of the work prepared by a person intimately connected with the same.

It was originally intended that the Chester and Holyhead railway should cross the Menai Straits by Telford's suspension bridge; but this plan was abandoned on account of engineering difficulties, and the site occupied by the present bridge was fixed on. It takes its name from the Britannia Rock, lying in mid-channel, on which its centre pier is founded. At this place, Mr. R. Stephenson proposed to build a bridge of two cast iron arches,

each of 350 feet span and 100 feet in height, which were to be erected without the use of centres, by continued additions to the spandrels, each piece being connected to its fellow on the opposite side of the pier by tie-rods. An end was put to this design by the requirement of the Admiralty, that the same height should be preserved at the springing of the arch as at the crown; in other words, that its under side should be a straight line.

In this position of affairs, the conception of a tube occurred to Mr. Stephenson; and to determine its shape and the details of its construction, he immediately, by authority of the directors of the line, instituted a series of experiments upon a magnificent scale. The first series of experiments was on 34 tubes, of different sections, round, oval and square or rectangular, varying in length from 18 to 27 feet, and in diameter from 9 to 18 inches. They were in all cases supported at their ends, the testing weight being hung in the middle, till fracture took place. The rectangular form was found to be much the strongest: it was the only one in which failure did not take place in the upper side.

When a beam, supported at its ends, is loaded at the middle, the fibres of the upper side are compressed; while those of the bottom are stretched. When, therefore, a beam of uniform shape is broken by the failure of the top, it is evident that the strength of the material to resist compression is not equal to that with which it resists tension; and vice versa. The power of cast iron to resist compression is to its power of resisting tension as 5 to 1; while these experiments showed that in wrought iron the proportion is reversed: its power to resist compression being to its power to resist tension as 9 to 11.

The second series was on a model tube, one-sixth of the dimensions assumed for the real bridge, 75 feet long, 4 feet high, 2 feet 9 inches wide. Six experiments were made with this model, to determine the proper proportion to be kept between the material of the top and of the bottom. In the last experiment, the tube broke with 86 tons suspended—equal to 172 tons distributed over its length—the sectional area of the top being 26½ inches, and that of the bottom 22½, or as 11 to 9 very nearly.

During these experiments, the masonry of the bridge was proceeding rapidly.

The Britannia rock is in mid-channel; and upon it is the tower called by its name, which at its base is 60 feet by 50 feet 5 inches. Its entire height is

221 feet. At a distance of 460 feet on each side of the Britannia Tower, stand the two land towers on the Carnarvon and Anglesey shores. At their base they are 60 feet by 37 feet. From the land towers to the face of the abutments, which stand still further inland, is a space of 230 feet; the abutments themselves are in all 176 feet long.

A large number of cast iron girders were built into the solid stone work, for the purpose of effectually distributing the pressures of the enormous weights which were carried by certain spots during the lifting of the tube. Of these, the Britannia tower contains no less a weight than 394 tons—the total weight in the towers and abutments being 929 tons.

The dimensions of the tubes having been definitely fixed, it was determined to build the four large ones on platforms or jetties, lying along the high water mark of the Carnarvon shore; then to float them to the foot of the towers; and finally to raise them to their places by hydraulic power. The land-tubes were to be built in their places on scaffolding.

Supposing one of the large tubes to be completed, and lying ready to be floated on the platform; it is 472 feet long—3 feet higher at the end which is to enter the Britannia tower than at the other, which is 27 feet high. It has eight cells in the top, and six in the bottom; in both cases 1 foot 9 inches high, but of different widths. The platforms forming the upper and lower sides of the top cells, are of single thickness; and they are connected with the upright plates of the cells by two angle-irons, matched on the opposite side of the plate by a flat strip. These junctions are formed by rivets, which are inserted at a red heat, and while hot are closed up—exerting, by their contraction, a great power on the plates through which they pass. The plates forming the sides, run vertically; and they are joined together by double T-irons, which form a pillar of great strength at every two feet distance throughout the tubes. These T-irons are bent round at right angles, and riveted to the platform of the top and bottom; and a triangular plate, called a gusset, is used to fill the corners with great effect, against the twisting strain exerted by the wind. The platforms of the bottom cells are of double thickness of plates, arranged so as to break joint; the covers (plates riveted over the joints) being large and strong; the whole forming in fact a chain to resist tension; while the top is construct-



ed with small covers and nicely executed joints, so as to act as a *pillar* to resist compression.

Cast iron frames of great strength are fitted into each end of the tubes, and into the lower set of cells, to resist the great strain occurring at the points of support in the towers. To these frames were fitted the iron beams to which the lifting chains were to be attached, and which consisted of three very strong cast iron girders, accurately fitted, having pillars of iron jammed between them, and a strap of wrought iron passing completely around them, so as to combine them all into one solid mass.

The tubes having been completed on the platforms, it was necessary that they should be cut away in order to make room for the pontoons by which the work of transport was to be done. Temporary stone towers were therefore built under each end; and the platforms having been built with an upward curve of nine inches, it was found that after they were cut away and the tube took its own bearing, the deflection only slightly exceeded this.

The beach beneath the tubes was next excavated to admit the pontoons. These were eight in number, each 100 feet in length; six of them of wood, 25 feet wide and 10 feet deep, and two of iron, 31 feet wide, and 8 feet 9 inches deep. These pontoons were sunk, by means of valves, below the tubes; and the valves were closed and the water then pumped out. The principle on which it was determined to conduct the floating of the first tube was, that the tube should be hauled out into the rising tide which runs in the required direction, when the velocity of the tide was such as to bring the tube to the foot of the piers just at the time of high water; the ends of the tube being brought over stone shelves, prepared at the bases of the towers, on which, as the tide descended, it would be left resting. Thus the tide itself was made to do the work of transport, and no exertion was necessary, except for the work of pilotage.

It is difficult to form a just estimate of the delicacy of this undertaking. Here was a mass of 2000 tons in weight, of an awkward shape, to be navigated in a tideway where the current is often eight miles per hour, and where the variations of the wind might create unexpected obstacles; but, owing to the prudence and foresight of Mr. Stephenson, the object was safely accomplished. On the 20th of June, 1849, at half past seven o'clock, the mass swung out into the stream, and at twenty-two minutes after nine, the tube reached its destination at the foot of the piers. As the tide ebbed, the pontoons floated away from below, leaving the tube to span the opening alone.

The next object to be accomplished, was to raise it through the 100 feet between that position and its ultimate place. This was done by hydraulic presses of enormous dimensions—that at the Anglesey end having a ram of 20 inches diameter, and a cylinder 10 inches thick; and that at the Britannia end, two cylinders, with rams 18 inches diameter. The ram carried a crosshead of prodigious strength of cast iron, strengthened on the top side by wrought iron links put on hot; from it depended the lifting chains, the lower ends of which were secured to the beams in the end of the tube. The "stroke" of the press, or the height which it was capable of lifting through, was six feet, and each link of the lifting chains corresponded in length. On the upper part of the frame of the press, 12 feet below the top of the crosshead when at the highest point of its lift, was an arrangement of "clams," which were blocks of iron, planed accu-

ately to fit the square shoulders of the head of the chain; by screws and gearing these clams could be opened or closed, so as to let the chain pass, or to embrace and hold it firmly. On the crosshead was a precisely similar arrangement. When, therefore, the press had completed its lift of six feet, the head of the third link had just reached the level of the clams. These being brought in under the shoulders of the link, transferred to themselves the weight of the dependent tube. The clams on the crosshead were then opened, the ram lowered, the top link taken off, the crosshead clams closed, and the bottom clams opened, when all was ready for another lift of six feet.

The whole of this ponderous machinery was supported on beams of wrought iron, of immense strength, which spanned the tower above the tube.

The time occupied in making each lift of six feet was about 38 minutes. The precaution was taken to underbuild the tube with brickwork in cement; and during the lift, a packing of thin wood was introduced between the top of the brick work and the bottom of the tube, that, in case of accident, an inch might be the greatest distance fallen thro'. That these precautions were not needless, was shown on the 17th of August, when the bottom of the cylinder of the single press broke, and allowed the tube to descend on to the packing. No serious injury was done to the tube, though the delay in procuring a new cylinder was considerable. The full height was reached on the 13th of October.

The expansion and contraction of such a length of metal is considerable, even under ordinary changes of temperature. Its effects are rendered more manageable, by allowing the tube to rest in the Britannia tower, and to expand outwards in both directions—there being arrangements of rollers, etc., in the land tower abutments, to facilitate its motion. The greatest motion hitherto observed in each half is 3 3-16ths inches.

The second tube was floated on the 4th of December, and lifted to its place on the 7th of January, 1850. The last of the land tubes for the first line was lowered to its place on the 4th of March, and on the next day Mr. Stephenson and staff passed through with a monstrous train, drawn by three locomotives. Ten days after this, the line was tested by the Government Inspector, with a train 434 feet long; which caused a deflection of less than three-fourths of an inch.

The third tube was floated on the 10th of June, and deposited on its permanent bed on the 11th of July. The fourth tube was floated on the 25th of the same month, and placed on the 12th of September.

The total weight of the tubes is nearly 11,000 tons. This weight is made up of 9,360 tons of wrought iron, and more than 1,200 tons of cast iron and timber. They are composed of about 186,000 separate pieces of iron, pierced by more than 7,000,000 of holes, and united by upwards of 2,000,000 rivets, the angle and T-iron being not less than 83 miles in length. The weight of the lifting chains alone, at each end of the tube, was more than 40 tons, which with the crosshead and ram of the press, made a total of more than 60 tons to be lifted before any effect could be produced on the tube itself. Of the masonry in the towers and abutments, there was about 2,500,000 cubic feet—the weight in all being about 150,000 tons.

The construction of this bridge may well be regarded as one of the most stupendous undertakings of modern times.

IRONTON, LAWRENCE COUNTY, OHIO,  
July 10, 1851.

H. V. Poor, Esq.:

Permit me through the columns of your valuable Journal, to give you and your readers some facts relative to this important mineral region, now but little known out of the State, and not much known or appreciated in it, except perhaps in this vicinity. There are but few people, comparatively speaking, who know that within a distance of twenty miles of this town, there are no less than thirty-five large blast furnaces, now in successful operation, producing annually seventy thousand tons of "Pig Iron"—worth at the present low prices (twenty-five dollars per ton), one million seven hundred and fifty thousand dollars.

To dig the ore, (viz., 175,000 tons), to chop the wood and make the charcoal (14,000,000 bushels) sufficient to make the above quantity of iron, to haul the same to the furnaces, and the iron thence to the Ohio river, and to do all other work necessary to manufacture this amount of pig iron, requires an expenditure of labor and money: to what extent is almost entirely unknown, except by the manufacturer himself. It is true, the farmers on the Ohio and Scioto rivers know that the "Iron Master" buys yearly a "right smart chance" of corn; but tell him the fact, that seven hundred thousand bushels are consumed annually by the furnaces, and he will look very incredulous.—The flour dealer of Cincinnati and elsewhere, also knows that a considerable quantity of flour is sent into this iron region; but he has little or no idea that the amount is equal to thirty thousand barrels per year. Neither is it generally known that these furnaces buy annually 1,500,000 lbs. of pork and bacon, 350,000 lbs. beef, besides other products of the farm to a large amount, such as mutton, butter, cheese, poultry, &c., &c., to say nothing of the amount of dry goods, groceries, boots and shoes, &c., which would amount in the aggregate to at least the sum of \$225,000.

During the years 1845, 1846 and 1847, the iron business was very prosperous, and the make of iron increased rapidly in quantity, from year to year; many new furnaces were built, and old ones which had long been out of blast, repaired and put in operation; there was then a large demand for iron at good prices, and labor and the products of the farm were higher; but the tariff and low duties of 1846, (deferred for a brief period by the famine in Ireland, and the consequent increased demand for breadstuffs from this country) soon began to be felt, and the iron business has now become so prostrated, that large establishments ceased operations in this section of country last year; and they are stopping, or have mostly all stopped in Pennsylvania and the eastern States; and were it not for the superior quality of our iron (it being better than Scotch pig), and the protection which the cost of transportation of foreign iron to the western States afford us, we too should be obliged to put out our furnace fires, and engage in raising agricultural products to feed the population of Europe, and rely wholly upon them for our iron and other manufactures. But situated as we are, so far inland from the seaboard, and hoping and expecting a better state of things in the future, our business has not sensibly declined in the quantity of iron made, although our profits are reduced to so low a figure as barely to compensate us for the depreciation of our property, caused by the consumption of the raw material, (ore, timber, &c.) and the interest on our capital invested; but notwithstanding

the very small profits, this mineral region is steadily improving in population and wealth, and if the low price of pig iron does not entirely prostrate the energies of these enterprising iron manufacturers it will continue to improve, and with the benefits of the important improvements now in progress, when completed, will perhaps enable this iron region to make iron at remunerating profits.

Among the improvements alluded to, the most important one is the completion of the iron railroad which commences at this town, on the Ohio river, running north through the entire county, and passing by, or very near to, ten furnaces, and intersects the Belpre and Cincinnati railroad, some six miles north of the town of Jackson, in the county of that name. The length of this road is about 52 miles, ten of which is nearly completed, from Iron-ton to Lawrence Furnace. When this ten miles is finished, which will be by 1st January next, it will be used by eight or nine furnaces, Olive, Buckhorn, Mount Vernon, Lawrence, Centre, Etna, Vesuvius, Lagrange and Clinton. These eight or nine furnaces will deposit their iron at Iron-ton—a town of some 1,200 inhabitants, beautifully situated on the banks of the Ohio river, high above any floods which have ever been experienced. The Ohio iron and coal company, purchased about three years since 300 acres of Ohio river bottom land, and laid out this town; it was then a cornfield, now it has the population mentioned, and three hotels, a large foundry in operation, employing fifty hands or upwards; a large rolling mill is in progress of building by some practical Pittsburgh men; dry goods, boot and shoe, grocery, clothing and furniture stores, abound; and last, not least, a bank of \$100,000 capital under the free banking law of this State, is now authorized to commence business, and will be soon in operation. Hon. James Rodgers, of Hanging Rock, President, and James O. Willard, of Buckhorn Furnace, Cashier.

Iron-ton is destined to become a large manufacturing town in a few years. It possesses superior advantages to any other place in the western country; its beautiful location on the Ohio river in the centre of this rich mineral region, the large amount of capital it can command, its proprietors being the wealthy "iron men" of this region, its facilities for procuring stone coal, and iron, at little or no cost for transportation, fully warrant this prediction. The company who own this town, foreseeing its vast importance as a manufacturing town, purchased four thousand acres of stone coal land, immediately back, and adjoining the town; the railroad passes through the centre of these lands, thus enabling the company to deliver coal at the various manufacturing establishments at the low price of one dollar per ton.

When the iron railroad is completed, should the iron business become more profitable, a number of new furnaces will be built along its route, there being an abundance of ore, stone coal and timber, the distance from the river having hitherto prevented the improvement of furnace sites in every respect as good as those now in operation. This iron must all be taken to Iron-ton over the iron railroad, and large quantities there manufactured into bar iron, castings, machinery, &c.

The tract of land purchased for the town of Iron-ton, extends along the Ohio river nearly a mile, affording a fine landing for boats of every description, the water being deep a few feet from the shore. Many of the wealthy "iron men" have built or are building fine residences, and are calculating to make Iron-ton their permanent home, and give to

it the benefit of their furnace profits as they accumulate from year to year.

I know of no place in the western country where mechanics of every description could do as well as here. The consumption of manufactured goods in the iron region is large, thus affording a good home market for a large amount, and there are facilities for transporting any surplus to the great markets of the west, in the cheapest and most expeditious manner.

A cotton factory for the manufacture of coarse cotton goods would do an excellent business here. It combines all the advantages of cheap fuel, cheap food, and cheap labor, and a large saving in the cost of transportation on the raw material and manufactured goods, to which the eastern manufacturer is subjected, to say nothing of the large expense incurred in sending bread stuffs to the east, to feed the mechanic or laborer there. A saving in these items of expense mentioned, would be a fair profit of itself.

The immediate prosperity of the town of Iron-ton and the iron region, depend somewhat upon the early completion of the iron railroad. That this road will be built, is certain, for enterprise, perseverance and capital, are here, perhaps, undeveloped in a measure now, but the future will bring it forth. If the railroad company could obtain some pecuniary aid at this time it would be of great advantage to this region, but the company are all practical "iron men," know all about making pig iron, and but little about the best method of awakening an interest to the importance of developing the inexhaustible resources of this rich mineral region.

#### AN IRON MAN.

#### Application of Iron to Railroad Structures.

We find in the last number of the Journal of the Franklin Institute, an article by H. L. Damsel, Esq., upon the comparative qualities of iron employed in the construction of railroads, the substance of which is given below:—

On the introduction of railroads, engineers were of opinion that iron railway bars would endure for an indefinite period, and that their destruction would eventually be effected by the oxydation of the metal from its exposure to atmospherical changes. But a real iron way had not long been constructed, and in use, before it was discovered that the iron bars were subject to abrasion and disintegration, by the sliding and rolling of the locomotive engines and carriages that traversed it; and that on lines having a considerable traffic, worked at high speeds, their destruction was effected within a very limited period. The injury to the rails from oxydation of the surface is scarcely perceptible on those in constant use. The abrasion of the head of the rail, thereby diminishing the width and depth of the bars, is on some railroads the means of lessening the duration of the rails. But lamination or disintegration of the fibres of the metal composing the wearing parts of the rail, is a fruitful source of expense on numerous railroads in Europe and America.

No sooner, however, was it discovered that the bars were liable to laminate and splinter, than a number of inventions were produced with a view of obviating the evil. It was supposed that the shape of the rails was faulty; and parallel, T or web-footed, bridge and plate rails have been used with more or less success. But from the diversity of opinion which exists among engineers respecting the best section for iron rails, it may fairly be inferred that of itself it is a matter of very little im-

portance; and we must look elsewhere for the cause of the evil complained of.

The occurrence of lamination in the rails may be traced to one or more of the following causes: 1st. From the line of rails being unsupported with a sufficiency of suitable sleepers and ballasting. 2d. From the improper state of the working stock. 3d. From a disproportion of the quantity of metal in the bars, and the weight of the locomotive engines and rolling load, and the velocity at which these are propelled. 4th. From the imperfect and negligent manner in which the bars are too often manufactured. 5th. From their having been manufactured from improper metal.

The condition of the permanent way has an important connection with the duration of the rails. If the ballasting has originally been made of unsuitable materials, or if it has since been negligently maintained, the very best rails are as liable to injury from this cause as the very worst. No matter what care may have been taken in their manufacture, if the rails be not properly supported at necessary intervals, or what is still better, continuously, crushing and lamination will ensue. The best manner of laying rails is on longitudinal strings of timber; and by using larger timber than hitherto adopted, the injury to the rails from the deflexion of stringers would be greatly reduced.

Injury may also be occasioned to the rails by a bad condition of the carriages and other working stock. If the wheel tyres are much worn, it will often produce a broken and splintered state of the outside edge of the rails—which, unless attended to, will extend inwards, and ultimately render their renewal necessary.

The rail at first laid down, and even now in many instances adopted, was much too light for the immense trains and great velocity so common in the present improved condition of locomotion, and it is now a well established fact that for railroads of the usual description, rails weighing from 75 to 90 pounds per lineal yard, are much safer and more economical than those of a less weight.

But after all, the principal cause of lamination in rails would seem to arise from the peculiar mode of their construction. Railroad companies, in their desire to secure good rails at low prices, generally stipulate with the manufacturers that a certain portion of the metal used in manufacturing each bar shall be of a definite quality and superior to the rest. But the effect of this mode of manufacturing will be evident when the process is detailed more at length. It may therefore be necessary to state that iron rails of whatever section, are rolled from a number of short flat bars, placed one on the other to form a "pile" as it is technically called, of the requisite size and weight. This pile for rails of ordinary dimensions, is about 3 feet long, 7 inches wide, and 9 inches high. With the present system of manufacturing, the body of the pile is built up with puddled iron, averaging about 3½ ins. wide by ½ an inch thick, and the length of the pile, while the top and bottom are each composed of an iron plate about one inch thick by seven inches wide, and of a similar length with the others. These plates are styled "best iron." Their employment being usually specified in all contracts, it is therefore compulsory on the part of the manufacturer. When rolled, the metal in these plates forms portions of the head and foot of the finished rail.

But this use of the "best iron," instead of rendering the rails better able to withstand the wear and tear of heavy travel at high velocity, strange



as it may appear, produces the very opposite effect. On the occurrence of lamination, it will be found that the strip of metal severed from the body of the rail rarely exceeds one third of an inch in thickness, let its breadth be what it may. By referring to the materials of which the rail is rolled, it will be observed that the plate of best iron, 1 inch thick, 7 inches wide and three feet long, is in the process of rolling, extended over the head of a rail, probably 20 or 24 feet long, and 3 inches wide, thus becoming reduced to less than one third of an inch in thickness. It is this thin covering of best metal, which it is customary to place on the heads of the rails to resist the wear and tear from the rolling of millions of tons of traffic. If soundly welded to the other layers, such a thin provision for wear may bear a few millions of tons; but if otherwise, it will probably peel off in long thin flakes before it has borne many thousands. Unfortunately for railroad companies, the latter is too frequently the case.

The reason why the welding is in so many cases imperfectly accomplished, is because the top plate requires a greater degree of heat to bring it to the welding point than the small bars of puddled metal, on account of its greater magnitude; and if it be thoroughly heated, the intense heat of the furnace must necessarily burn the small bars. The desire of producing large quantities of rails in a limited period, often induces the manufacturer to hasten the heating powers, and thus the pile is not unfrequently drawn before the smallest bars have been properly heated. By so doing, the waste of metal and consumption of fuel in the operation, is considerably diminished, and a corresponding saving effected to the manufacturer. The workmen too, from being paid by the contract on the quantity produced, have a direct inducement to withdraw their charges before they have been properly heated, of which it is believed they take advantage, to the loss of the purchaser.

A set of experiments was recently made on nearly 50 tons of rail, to test this matter. The rails were of a fair average quality, selected indiscriminately from a heap of several hundred tons, which had been manufactured at various periods during the past ten years. The result was that of 272 bars tested, 45 or 17 per cent. were sound and free from any defects in the welding of the top to the other plates; 148 or 54 per cent. were more or less imperfect; while in 79, equal to 29 per cent. of the whole, the top plates were but superficially united to the others. The perfectly sound bars would probably wear for some time; the imperfect ones might, under favorable circumstances, stand considerable rolling before laminated; but the remaining quantity which had not been welded, would not sustain any heavy traffic. It is not, therefore, surprising that with such a large per centage of imperfect rails, lamination should extensively prevail on the majority of railroads now in use.

The employment of the best iron in the rail pile, is attended with another disadvantage. It is generally admitted that the metal in the wearing part of the rail should be of a hard and solid texture; and premising that the thin layer of best iron has been securely united, it is not of this character. Being manufactured from the same description of puddled iron as that used in the body of the pile, the difference between them consists in its having visited the heating furnace and undergone an extra rolling. By this extra rolling, it has increased its fibrous character, and parted with a portion of its cinder, to which it owes its welding properties. On

being reheated in conjunction with the new puddled iron, it is incapable of furnishing the quota of cinder necessary to their complete cohesion; and the weld, though apparently perfect, is incomplete, while the metal itself, from repeated rollings and reheatings, has acquired an open, fibrous character, easily ruptured by pressure and concussion.

In order to avoid these imperfections, it is suggested that the whole bar should either be rolled from puddled iron or from the best iron, in either of which cases it might be welded in a permanent manner. The most advantageous way however, it is said, would be to dispense altogether with the use of the "best iron" which is always more liable to lamination than less highly wrought metal.

#### Mining in Great Britain.—No. II.

The most regular tin and copper lodes are very complex in their composition; quartz generally prevails in the matrix, but is always more or less blended with a substance similar to the adjoining rock—indeed, the latter often occurs in distinct forms, as nodules, angular pieces, and even masses of considerable size, which are independent of the main rock, being completely enveloped in the quartzose part of the lode. These are of such common occurrence, as to be named by the miners *horses of killas*. Sometimes the schist so abounds in the lode, that the quartzose part altogether disappears, or is only continued in minute strings; in this case the lode is said to have dwindled away, or to have been *wrung out*. It also frequently happens, that both these principal parts (the rock and the quartz) are intimately united, producing a silicious layer of rock, which is still metalliferous, and is commonly called *capel*—hence the courses of schorl rock, porphyry, and some anomalous rocks, which have been called by the miners *elvan*, have been properly considered by them to be analogous to lodes; for they are in fact veins on a large scale; and from the great width of many of them, they are termed channels or courses; they are generally composed of hornstone, quartz and felspar, having the appearance of hornstone porphyry. Other substances, however, are called *elvan* by the miners. Thus, a stone composed of very compact hornblende and chlorite, is called *blue elvan* in Wheal Ann; a mixture of hard hornblende and quartz has the same name at Boalack; a compound of felspar and hornblende is *elvan* at Gwalior, and is as soft as the neighboring country; a mixture of hornstone, quartz, schorl, and chlorite, forms the *black elvan* of Chacewater; and the fine-grained granite is the *elvan* of Rosewall Hill. Hardness is not an essential quality of *elvan*. The *elvan* courses vary in width from one to sixty fathoms, or three hundred and sixty feet. Their direction is generally a little north of east and south of west; and they almost always underlay towards the north—perhaps, on an average, a foot to every foot in depth, or at an angle of 45°. The extent of their length has never been ascertained, although one of them has been traced five miles.

"By a true vein (Mr. Carne says), I understand the mineral contents of a vertical or inclined fissure nearly straight, and of indefinite length and depth. Their contents are generally, but not always, different from the strata or the rocks, which the vein intersects. True veins have usually regular walls,\* and sometimes a thin layer of clay, between the wall and the vein. Small branches are also frequently found to diverge from them on both sides. Contemporaneous veins have been usually distinguished from true veins by their shortness, crookedness and irregularity of size, as well as by the similarity of the constituent parts of the substances which they contain to those of the adjoining rocks, with which they are generally so closely connected as to appear a part of the same mass. Two other marks, more distinctive, must be added. When these veins meet each other in a cross direction, they do not exhibit the heaves or interruptions of true veins, but usually unite. In

\* By this term is meant, that the rock of the country stands against the vein, on each side, as a wall, without being intermixed, or forming one body with it.

a multitude of contemporaneous veins, some may appear to be heaved; but the apparent heave seldom affects more than one vein—and it is in general easy to perceive that what appear to be separate parts of the same vein, are different veins, which terminate at or near the cross vein. When they meet with true veins, they are always traversed by them." Tin lodes are, in general, richer or poorer in the *elvan* than in the adjoining rocks in proportion to the hardness or softness of the *elvan*. A very soft, or very hard gossan (earth-brown iron ore), is equally thought less favorable than if its consistency be moderately firm; and a very dark color is also discouraging. The copper gossans are generally softer, paler, and less quartzose, or rather, perhaps, the quartz in them is often friable; and they are more vesicular than tin gossans.

In granite, the lodes which are chiefly productive of tin are, for the most part, composed of a pale greenish felspar, of a confusedly crystalline structure; but seldom containing distinct crystals.

Through this substance the tin ore is interspersed in form of crystalline granules, seldom so large as a pea, but generally as small as sand.

The lodes which yield copper ore in granite almost always contain gossan near the surface; and this usually continues to somewhat greater depths than it does in slate—as at Tresavean, Ting Tang, Dolcoath, &c., in Cornwall. When the lodes are very granitic, or when they contain much of the schorlaceous quartz, they are seldom productive—indeed, copper ores are rarely found embedded in schorl. The lodes which yield copper ores in slate contains large quantities of gossan of a pale hue, soft, and full of soft cavities. In them, also tin ore frequently occurs in small quantities, and blende is very plentiful; but iron pyrites (mundic) is almost constantly present. These earthy minerals are mostly quartz, mixed with quantities of felspar, clay or flookan; near the surface these are spotted with earthy black copper ore, and at length by copper pyrites. In many places, and more especially in the slaty rocks in the neighborhood of the fossiliferous beds in the eastern district of Cornwall, some portions of the lodes, when large, consist almost wholly of a very white crystalline quartz, abounding in vugs, or cavities, lined with crystals of the same, and enclose innumerable disjointed pieces of slate. The cavities lined with crystals, and the included spots of slate, are most unequivocal signs of poverty in these parts of the lodes where they occur. There are also certain minerals which are seldom found in the richer parts of lodes; in those which yield copper ore, chlorite (provincially called *peach*) is one of the most conspicuous. The occurrences of tin ore in the deeper parts of lodes which have previously produced copper ore only, is accounted a very unfavorable indication. Ores of a certain character produce the same metal; and the miner, from experience, can immediately say which ore contains copper, which tin and which lead.

It is generally, if not invariably, the case that a peculiarly favorable matrix for copper ore is found at the juncture of killas and granite, and the richest and most numerous veins are generally discovered in killas [clay-slate] at no great distance from the granite, and are seldom sought after anywhere else by cautious miners. The pale blue killas generally accompanies a rich vein of copper, and it is the easiest to work on, in sinking shafts and pursuing discoveries. The lodes vary in width from one inch to thirty feet, but the most general in tin and copper veins in Cornwall is from one foot to thirty feet, and in the thinner veins the ore is less mixed with other substances. A lode composed of beautiful spar, yellow ore, white iron, and a portion of mundic, is seldom known to fail making a great quantity of ore. The *underlay* [or deflection from the perpendicular] of lodes is north and south. If the north side of the roof of a church were, retaining its slanting position, supposed to be underground, it would give an idea of the direction of a lode. In deep mines the lode sometimes passes through the killas, and is continued in granite.

When copper lodes, from a state of poverty, become either gradually or suddenly rich, the change is rather in the qualities than in the constituent parts of their veinstones; as from hard quartz or capel to quartz in a state of decomposition, called



by the miners *sugary spar*, or to soft chlorite, which they call peach. Another frequent change is from a very solid compact lode to what the miners call a *hallop* lode, abounding in cavities. Sometimes the lode becomes greatly enlarged. It is generally believed that wherever a lode is rich, if there be another lode near it, having nearly the same direction and in the same country, whether killas or growan, even in an elvan course, it is probable that the second lode will be found rich in that part which is opposite to the rich part of the first lode. The phrase, *ore against ore*, is of early date; but although this circumstance has undoubtedly often occurred, yet, in many places the miners have been disappointed in their expectations. There is also a very general idea, that a lode which has been rich in one part is likely to be rich in every other; that such a lode may be rich in many parts, distant from each other, has been proved in several instances; but for want of proper attention to the connection which appears to exist between the lodes and the rocks which they intersect, very large sums of money have been spent to no purpose. In Wheal Ann £30,000 were lost in exploring the same lode as had been rich in Wheal Alfred; had it been a different lode, the adventurers would have been satisfied with a much less expensive trial. In Tregajoran and Burncoose (Carn Brea) the adventurers laid out, and eventually lost a large sum on the lode which had been productive in Cook's Kitchen and Tincroft—on the other hand, in several mines, of which the principal lodes were partially exhausted, by driving northward and southward, other lodes have been discovered, which are now uncommonly productive.

The fairest method of working a mine, and which is generally adopted in the best conducted, is to promote *discovery*; ground being constantly opened, but more than half the ore found taken away, the other half being left as a reserve, in case of any temporary falling off in the mine, that there may be something to fall back upon whilst operations are extended in search of more; and great skill and judgment are required in a mining captain to arrange the workings, so as to keep up a regular and good supply of ores.

The legitimate value of a mine chiefly depends upon the value of the ore actually discovered underground, and the reasonable anticipations of further discoveries being made, as determined by the state of the mine and the richness of the district in which it is situated—the value of the mineral produce of the market, and the value of the machinery materials, and erections on the surface; and persons entering upon mining, with the view of a permanent investment, would do well to remember this, and not to take as a sole criterion of the value of a mine, its having realised large profits; for there is such a thing known to miners as "picking out the eyes" of a mine, or taking away the reserved ores, in order to make those very profits, and so raise a fictitious value for their shares in the market!

Many cases have occurred where every branch of ore discovered has been exhausted, and the profits divided immediately; so that when the lode for a time became small and profitless, calls had to be made upon the pockets of the proprietors for money to extend their operations, which, by proper management, should have been paid out of the produce; and the mines, in consequence of not paying, have been "knocked," or abandoned, by one party, and soon after taken up by another, who, by working fairly and properly, have made them both good and lasting.

In the case of a lode unexpectedly becoming poor, the mine, under this dangerous system of working, has no resources in itself to furnish the means of paying its ordinary expenses. The system of taking away all the ores may be compared to a man who lives at the very extent of an income which is dependent upon his own exertions. If a fit of sickness overtakes him, he has no resources whatever; but, independently of the risk which attends this system, it is enormously expensive. In the first place, it is obvious, that even if all the lode consists of ore, a mass of ore can be taken away from above, at much less expense than from below; but this is the least important part. In *stopping* downwards, the whole of the lode, whether good or bad, must be taken away, as it is impossible to get

at the ore without taking away the *dead ground* also, and all this work must be done before the lode is properly drained.

The mixture of the ore with the rubbish also occasions much greater expense in dressing it, and causes considerable waste, as when so much washing is necessary, the finer parts of the ore (especially the rich black oxide of copper) are liable to be carried off by the water. This mode of working also occasions a much greater consumption of timber for the purpose of keeping open the space from which the lode has been taken.

#### Cotton Statistics.

In 1641. The first mention of cotton, the soft and beautiful vegetable substance forming the covering or envelope of the seeds of the gossypium or cotton plant, as an article used in manufacture, appears in a small treatise, entitled the *Treasure of Traffic*, written by Lewis Roberts, author of the noted book, *Merchant's Map of Commerce*, in which treatise it is stated that "the town of Manchester buys the linen yarn of the Irish in great quantity, and weaving it, returns the same again to Ireland to sell; neither doth her industry rest here, for they buy cotton wool in London that comes first from Cyprus and Smyrna, and work the same into fustians, vermillions, dimities, and other such stuffs, which they return to London, where they are sold, and thence not seldom are sent into foreign parts, which have means on far easier terms to provide themselves of the first material."

1690. About this time the art of calico printing was introduced into England from France. It ranks amongst those advantages which England gained by the revocation of the edict of Nantes, by Louis XIV., in 1685.

1693. A prescriptive claim, set up by the lord of the manor, for a duty of twopence per pack on all goods sold within the manor is defeated.

1695. By an indenture bearing this date, it appears that the fee with an apprentice to a Manchester manufacturer, was sixty pounds, serving seven years.

1701. The town of Liverpool rises rapidly into importance, and first forms the port of Manchester.

1701. The import of raw cotton was 1,985,868 pounds, the export of cotton goods being £33,253.

1730. Mr. Wyatt spins the first cotton yarn in England by machinery.

1736. The Dutch first export cotton from Surinam.

1738. The mode of *spinning by rollers* further improved by John Wyatt, and a patent taken out in the name of Lewis Paul, his partner.

1740. The agency system commences, and cotton weaving extends into the country.

1740. About this time Manchester merchants began to give out warps and raw cotton to the weavers, receiving them back in cloth, and paying for the carding, roving, spinning and weaving. Guest says, "the weaving of a piece, containing twelve pounds of eighteenpenny weft, occupied a weaver, about fourteen days, and he received for the weaving 18s.; spinning the weft at ninepence per pound, 3s.; picking, carding and roving, 8s."

1743. East India yarns used in Lancashire, up to this period, for the finer kinds of goods.

1743. The import of cotton wool amounted to 1,132,288 lbs. The quantity retained for home consumption, 1,091,418 lbs.

1749. The import of cotton wool amounted to 1,658,365 lbs. The quantity retained for home consumption, 1,327,367 lbs.

1759. Manchester begins to grow into celebrity for its cotton manufacture: the entire value of the cotton goods made was £200,000 per annum.

1761. Arkwright obtained the first patent for the spinning frame.

1761. The first English "Navigation Canal," extending from Worsley to Manchester, is opened June 17th. It originated with Scroope, Duke of Bridgewater, called the "Father of Inland Navigation in England."

1764. Cotton markets first opened abroad. At this time the trade of Manchester was greatly pushed by the practice of sending out riders for orders all over the kingdom, carrying with them patterns in bags.

1764. The following table of cotton wool import-

ed, and cotton goods exported, contrasted with similar tables of more recent date, will prove an extraordinary record:—

COTTON WOOL IMPORTED.		COTTON GOODS EXPORTED.	
	lbs.		Official value.
1697.....	1,976,359	1697.....	£5,915
1701.....	1,985,868	1701.....	23,253
1710.....	715,008	1710.....	5,698
1720.....	1,972,805	1720.....	16,200
1730.....	1,545,472	1730.....	13,524
1741.....	1,645,031	1741.....	20,509
1751.....	2,976,610	1751.....	45,986
1764.....	3,870,392	1764.....	200,354

1770. The manufacture of ginghams, &c., is greatly improved by the inventions of Mr. Meadowcroft.

1772. James Hargreaves applies the contrivance of a crank and comb to take wool off the cards in a continuous fleece.

1773. The manufacture of calicoes introduced about this time.

1774. An act of Parliament, by which a duty was imposed on printed, painted, and stained cottons, declares the manufacture to be lawful.

1779. Mule spinning invented by Hargreave.

1780. The manufacture of muslins introduced. The import of raw cotton was upwards of 6,700,000 pounds; and the export of cotton goods was £355,060.

1782. A panic was created in Manchester by the circumstance of 7,012 bags of cotton having been imported between the months of December and April.

1782. First import of cotton from Brazil into England.

1783. Power looms invented by Dr. Cartwright—steam-engines used in cotton factories.

1784. The "Fustian Tax" imposed on the suggestion of the Right Hon. William Pitt. Great consternation was excited by this act in Manchester and the neighborhood; 15 houses, employing 38,000 persons in different branches of the cotton trade, petitioned against it; and the masters dyers and bleachers announced that "they were under the sad necessity of declining their present occupations until the next session of Parliament."

1785. The "Fustian Tax" repealed through the endeavors of Mr. Thomas Walker and Mr. Thomas Richardson, who were presented with a silver cup each. Splendid processions upon the occasion, May 17th.

1785. The privileges of the spinning-jenny, which had partly been thrown open in 1783, were in this year wholly given to the public, when cotton mills began to increase as well as the population.

1787. Muslin manufacture rises into note through mule spinning, and 500,000 pieces are manufactured in Great Britain.

1787. Steam engines first introduced into the Lancashire cotton factories, by Messrs. Peel at Warrington.

1787. The value of exported cotton goods, in this year (immediately after the overthrow of Arkwright's patent) amounted to £1,101,457.

1788. East Indian and North American cotton first imported.

1788. A meeting was held in Manchester to consider the great depression of our cotton manufactures, arising from the "immense importation of Indian goods;" and government was solicited to allow a drawback as an encouragement to the export of English products. It was estimated that the cotton manufacture employed 159,000 men, 90,000 women, and 101 children.

1789. Sea Island and upland cotton first planted in the United States.

1789. The first steam engine for spinning cotton erected in Manchester. The improvements made in the steam engine by Watt, and the various inventions, each contributed to advance the extent of the trade. The quantity of goods produced was augmented thirty-fold.

1790. The cotton spinners of Lancashire and Scotland solicited permission of the government to create themselves into a "Company of Traders," with privileges similar to those enjoyed by the East India Company, with whom, it seems, they considered themselves otherwise unable to compete.

1790. The import of raw cotton was 31,500,000 pounds; and the value of cotton goods exported was £1,662,369.

1790. Slater, an Englishman, builds the first American cotton factory, at Pawtucket, Rhode Island.

1790. It was mentioned as an extraordinary fact, that Manchester paid in postages £11,000, being a larger amount than any other provincial town.

1790. Messrs. Grimshaw, of Gorton, erected a factory at Knot Mill, for the introduction of power-looms into Manchester, but the experiment did not succeed.

1793. Eli Whitney, an American, invents the cotton gin, which he patents.

1800. Quantity of cotton wool imported was 56,010,732 pounds.

1814. The declared value of all the woolen, silk, and cotton goods exported from Great Britain was £14,658,442.

1815. The power loom introduced into the United States, first at Waltham.

1815. The export of twist legalised by Parliament, at which time the consumption of cotton amounted to 99,306,343 pounds, increased in two years to 124,912,968 pounds.

1817. The number of spindles in Great Britain are estimated at 6,545,833, and the number of operative spinners at 110,763, by Mr. John Kennedy, of Manchester.

1820. The import of cotton wool for home consumption was 152,829,633 pounds, the duty on which amounted to £426,957 11s. 3d.

1822. The first cotton factory in Lowell erected.

1822. The New Quay company began by Mr. John Brettargh and two others, with a capital of £30,000.

1823. The import of cotton into Great Britain was 187,231,520 pounds, of which 171,993,160 lbs. were imported into Liverpool, and may, therefore, safely be said to have been consumed in and about Manchester.

1823. There were 2,500 looms employed on silk, and about 3,000 on mixed goods.

1826. Self-acting mule spinner invented in England by Roberts.

1830. The number of yards of goods printed in Great Britain was 130,053,520; the amount of capital in the trade was £56,000,000, employing 230,400 persons in factories alone.

1833. The quantity of cotton wool imported was 283,000,000 pounds.

1832. A new throstle frame invented by Mr. Robert Montgomery, of Johnston, Scotland.

1832. There were from 12,000 to 14,000 looms, and ten throwing mills, giving employment to about 3,000 hands.

1833. The import of cotton wool was 303,656,837 pounds, and the duty £473,011.

1834. The quantity of cotton retained in England for home consumption was 295,684,997 pounds.—The export of cotton yarn amounted to 76,478,468 pounds. The quantity of yarn spun in England was 241,731,118 pounds.

1835. The declared value of cotton manufactures exported was £15,306,922; and of yarn £4,704,823.

1835. The quantity of cotton retained in Great Britain for home consumption was 330,829,834 pounds. The export of cotton yarn amounted to 82,457,885 pounds. The total quantity of yarn spun in England was 248,114,531 pounds.

1835. According to the Parliamentary return, the total number of power looms employed in the manufacture of silk, in Manchester and Salford, was 300. The total number throughout the United Kingdom was 1,716.

1836. Of 63,693 persons employed in mills in the parish of Manchester, 35,283 were females; 37,930 were above the age of 18 years, and 16,965 were below the age of 15.

1838. The amount of steam power employed in the various branches of manufacture in the Parliamentary boroughs of Manchester and Salford was—Manchester, 7,926; Salford, 1,998; total horses' power, 9,924.

#### Virginia.

**South Side Railroad.**—A locomotive has been manufactured in Petersburg, Virginia, by Uriah Wells, Esq., for the South Side railroad.

#### Strength of Pillars.

Mr. Buchanan communicated, in 1848, to the Scottish Society of Arts, an interesting exposition of the strength of materials, including the compressive strength on posts and pillars, and the remarkable effects of the length of the pillar in diminishing its strength. On this subject much light has been thrown by the experiments of Messrs. Hodgkinson and Fairbairn. Pillars or rods were tried of different lengths, from 3 inches to 5 feet, and of different diameters; rods half an inch diameter, with 3½ inches length, bore 11 tons; but when the length was 7½ inches it only carried 5 tons; when 15 inches long, 3 tons; and at 30 inches, only 13 cwt. From these experiments a general rule may be drawn for different lengths. Taking the strength of cast iron as formerly given at 50 tons per square inch, this will hold good in pillars till the length reaches five times the diameter, and then it begins to diminish. When the length is ten times the diameter, the strength is reduced to the proportion of 14 to 1; with the length at 15 times the diameter, it is reduced as 2 to 1; twenty times as 3 to 1; thirty times as 4 to 1; and forty times, as 6 to 1. Hence the great advantage in cast iron of using hollow pillars or tubes in place of solid metal, whereby, with the same area or section of fracture, the diameter of the pillar is increased, and with it the resistance to flexure, and an increase of strength in proportion to the length. A solid pillar, for instance, 6 inches in diameter, if extended to 7½ feet in length, would be weakened one-half, but if cast hollow, 10 inches in diameter, and three-fourths of an inch thick, giving the same weight of metal per foot in length, it might then be extended to 12½ feet, and still possess the same strength as the other. In all these cases a remarkable circumstance was observed in regard to the mode of applying the strain. With the ends of the pillar turned flat, and a flat plate interposed at top and bottom, which is the case in supporting buildings, this was found to sustain nearly three times as much as when the pillar was rounded on the ends, so as to make the force pass directly through the axis, as occurs so frequently in machinery with the connecting-rods of steam engines, and in other cases.

#### Improvements in Smelting Iron.

Mr. Andrew Barclay, C. E., of Kilmarnock, has secured a patent for a peculiar arrangement of blast-furnace for the smelting of iron, which is stated to effect a considerable saving in fuel, time, labor, and expense. The furnace is circular, or may be of any other suitable internal shape, and is provided with three tuyeres, communicating with the main cold air-pipe by vertical branches. Each tuyere has a triple branch, furnished with stop cocks—one of which opens into the small end of a bell-shaped chamber, forming part of the furnace; while the other two communicate with it at the sides near its junction with the body of the furnace. Each chamber has a charging place, closed by a louver door, for the introduction of fuel while the blast is on. Fuel and carbonaceous matter being introduced into the chambers, in addition to the charge of ores, the blast is turned on at each central pipe, so that the fuel is quickly ignited; but as the air passing through the incandescent fuel becomes deoxidised, more air is supplied by turning on the blast through the side pipes. More equally to diffuse the heat, additional tuyeres may be provided, which will enable the furnace to perform the double operation of combining and separating. In another arrangement there are also three tuyeres—the blast-pipe of each of which terminates in a forked branch. One arm of this serves to admit air above the burning fuel, while the other conducts the blast beneath the grate-bars, and through the fires in the chambers to the body of the furnace. There is also another construction in which two tuyeres are employed; and in each case the blast can be so regulated as to vary the quantity of oxygen, according to circumstances, and the quality of iron required. When it is to be converted at once into malleable iron, it is run into ladles at the time for charging the puddling-furnaces, and poured in them in a melted state, with a sufficient addition of carbonaceous matter. It is recommended, when erecting furnaces on this construction, to have the floor of the blast higher than the charging door of the puddling-furnace, to facilitate

the operation. There is also a claim to a steam cylindrical blower, which keeps up a regular blast by alternately filling with steam and condensing it, effected by any proper mechanical arrangement of stop-cocks and valves.

#### New Line of Steamships.

A new line of the largest class of steam propellers is about to be established between Boston and Liverpool. It is to be composed of four ships, the first to be ready to take her place on the 1st of August next.

This movement shows the determination of Boston to maintain her position as an importing city. Of late she has suffered greatly from the overshadowing influence of New York. Her lines of railroad are now completed, connecting her with the navigable waters of the Lake, and with Montreal, and a vigorous effort is to be made to render Boston the importing port for the Canadas, as well as to add to the convenience of those importing for domestic consumption. We heartily wish success to this new move. We copy from the Boston Courier the following in relation to this new enterprise:—

The first line of these new steam packets will, we understand, consist of four vessels, and occupy the route between Boston and Liverpool. The first one will take her departure about the first of August ensuing. She is named the "S. S. Lewis," and is one of the most splendid vessels of her class ever seen. She is of not less than 1800 tons burthen, and altogether the most costly ship ever owned in Boston. She belongs to "the Ocean Steam Ship Company of New England," incorporated by the state of Massachusetts, with an authorized capital to an immense amount—larger, it is believed, than that of any other similar incorporated company in the United States. In a few days, then, the "S. S. Lewis" will come from the hands of the constructors, and take her berth at the wharves of the Grand Junction railroad and depot company, and thence leave on her first voyage over the Atlantic. The day of her departure will be the dawn of a new era in this section of the country; for she will be the American file-leader of a new means of transportation and transit between New England and the Old World; the Yankee pioneer of a change in our commercial intercourse and relations both at home and abroad—a change, destined to be as impulsive, eventful and lasting, as marked and beneficial in its result,—so far as the traffic of our citizens with foreign climes is concerned, as has been effected among us, in the way of internal improvements, inter-communication and internal trade by the iron horse upon the land; a change, it may be added, which, as it goes on from year to year, involving, as sooner or later it must, steamboat building among us, and all matters connected with it, will create more and more activity in every branch of business among the people, to an extent, indeed that it were vain to expect to see realized in any other way.

This new and superior line of steamers has been founded by Messrs. Harnden & Co., of this city, in conjunction with a number of wealthy and powerful parties—not less eminent for their foresight and energy in commercial matters, than for their resources and influence in the community. The originator of this house, it will be recollected, was the person who established or led to the establishment of all the expresses upon the railroads in the United States. Leaving some time ago this particular branch of business to their successors in it, they have since been engaged as merchants and bankers, and now the public are again indebted to them for being among the first to lead in the establishment of American steamships from Boston to the ports of other nations; an undertaking, by far the most important for New England, that has been projected since the introduction of railways and locomotives among us—the most momentous and promising, in fact, that now remains to be carried on in this quarter of the country.

P. S. It has been stated that the steam ship "S. S. Lewis" will be in her dock in East Boston about the first of August ensuing. It is proper to add, that trains of cars are expected to leave Ogdensburg



and Montreal, with delegations from the merchants and principal men of those cities, and of Quebec, Toronto, Hamilton, and other places along the routes, in season to meet the new ship on her arrival, or for the passengers by these trains from the upper roads to visit her previous to her departure for England.

#### The first Steamboat on the Ohio River.

We find in the Cincinnati Chronicle the following statement, signed by J. Winton and Wm. McGranahan of Newport, Kentucky, in relation to the first steamboat that navigated the Ohio River:

As there are many erroneous opinions extant concerning the first steamboat built on the western waters, the undersigned would like you to publish their evidence in the matter.

In the fall of 1811 we were both present at the launching of the first steamer built on the Ohio river, and on board of her. She was built at the Pipetown shipyard at Pittsburgh; was intended for the Pittsburgh and New Orleans trade, and called the "Orleans." She was built after the fashion of a ship, with portholes in the side—long bowsprit—painted a sky blue. Her cabin was in the hold.

She left in November of that year (1811) for New Orleans and made the trip down in safety, but was never able to get back over the Falls, her power being insufficient to propel her against a strong current. She continued to run below the Falls for some time. Many persons are of the opinion that the *Enterprise* was the first boat built for the above trade. Such is not the fact. The *Enterprise* was the fourth or fifth boat built. The names of the others were the *Aetna* and *Vesuvius*, built by a company who had a charter for 14 years renewable, for the sole navigation by steam, of the Ohio and Mississippi rivers. The *Enterprise* was built at Brownsville by a private company, and on her arrival at New Orleans was attached for an infringement of the chartered rights of the company. A legal investigation followed, and the owners of the *Enterprise* gained the suit by proving that the plaintiffs had violated their charter. Thus ended the steamboat monopoly on the Ohio and Mississippi rivers.

#### Water vs. Railroad Carriage.

The Michigan Central railroad company have established a grain warehouse at Michigan city, and have undertaken to compete with lake vessels in transporting produce to Buffalo. The following we learn from the Michigan City News, is the difference in price by the two modes of conveyance:—

The freight price, by railroad to Buffalo, is 10 34-100 cents for 56 lbs.; but ordinarily the cost will be 11 cents, as the railroad charge is 14 cents per 100 lbs., and freight from Detroit to Buffalo 3 cents per bushel. By propeller, the usual rates are six cents per bushel to Buffalo; and produce, by this conveyance, reaches Buffalo as soon, within three days, as that shipped by railroad. This gives a difference of five cents in favor of the lake, as there is no warehouse charge upon grain received and sold to the forwarder after the opening and before the close of navigation.

#### Sheet Iron Pipes.

Sheet iron pipes of a new manufacture have lately been introduced into England from France, where they have been in use for several years.—They are made of sheet iron, which is bent to the required form and then strongly riveted together, after which they are coated with an alloy of tin, and the longitudinal joints are soldered so as to render them both air-tight and water-proof. In order to give them more stiffness, they are next coated on the outside with asphaltic cement, and if they are intended to be used as water-pipes, the inside is also coated with bitumen, which resists like glass, the action of acids and alkalis. They are so elastic that they will bear a considerable deflection without injuring the pipes, or causing any leakage at the joints. The vertical joints screw together in the same manner as cast-iron gas-pipes. These pipes have been used for water, for gas, and for draining, and are found to be more economical than cast iron, besides being less liable to leak,

and for water pipes they are more healthy than the common ones.

**Suspension Bridge across the Mississippi.**—The Burlington (Iowa) Hawk-Eye states that Mr. Field, who is now engaged in constructing a suspension bridge across the Kentucky river for the Louisville and Frankfort railroad, proposes to the city council of Dubuque to erect a suspension bridge across the Mississippi at Dubuque. He offers, if suitable charter can be obtained, to take one-fourth of the stock; or, if \$100,000 can be obtained, he will take the balance of the stock. The city council have not replied to his proposition.

#### Illinois and Michigan Canal.

The report of the Treasurer exhibits the condition of the affairs of this company, on the 30th of November, 1850, as follows:—

The balance on hand, November 30, 1849, was.....	\$116,016 42
To this add—	
Sale of Canal lands and lots.....	263,907 04
Tolls received in 1850.....	125,504 25
Interest and exchange.....	4,781 96
Sale of old materials, &c.....	196 65
	394,326 90

Total to be accounted for 30th of November.....\$510,313 32

The amount expended during the same period, by statement of Treasurer, was as follows:—

Payments on account of principal and interest, on loan of \$1,600,000, between 1st of Nov. 1849, and 30th Nov. 1850.....	331,794 86
Maintenance and repairs of Canal, including damages by freshets, &c.....	56,415 20
General expenses and contingencies.....	23,324 01
Canal lands, land damages, 12,270 51	
Tolls, collectors and inspectors, drawbacks, &c., &c. 6,097 28	
	429,901 86

Balance to be accounted for.....\$80,441 46

Of this balance, \$63,894 83 is deposited in the American Exchange Bank, New York, at interest, and the residue, \$16,546 60, in Illinois.

The canal was open for navigation 259 days in the year 1850, during which time the aggregate number of miles passed by boats navigating the canal was 333,141, equivalent to 3,501 boats through the entire canal.

The aggregate number of miles travelled by passengers, was 2,967,384, equivalent to 30,710 passengers through the entire canal.

Taking some of the same articles transported on the canal in 1849, and comparing them with the same quantities in 1850, it will be seen where the increase is, and where the decrease in the articles enumerated has taken place, for example:—

	1849.	1850.
Pork, barrels.....	9,398	12,933
Salt.....	58,353	24,609
Sugar, pounds.....	4,218,238	5,680,324
Merchandise, pounds.....	9,176,943	10,372,623
Wheat, bushels.....	573,598	417,036
Corn.....	754,288	317,674
Coal, tons.....	7,579	3,361
Lumber, M. feet.....	26,882,000	38,687,528
Tolls received.....	\$118,375	\$125,504
The annual sale of town lots in 1850 produced.....		\$82,750 00
Canal lands, 6,443 acres.....		40,212 18

Total.....\$122,962 18

Or \$26,659 54 greater than the annual sale of 1849.

Notwithstanding several unforeseen obstacles which the company have had to encounter, the general result of the operations of the year exhibits a

small increase in the revenue, of from \$118,375 in 1849, to \$125,504 in 1850, with the prospect that the business of 1851 will be more favorable than that of the past year.

#### Texas.

**Buffalo Bayou, Brazos and Colorado Railroad.**—We have received the report of John A. Williams, Esq., Chief Engineer of this road, giving the results of his preliminary surveys and examinations for a railroad route from Harrisburg to the Brazos river. These surveys were commenced May 17th, and the first division of eighteen miles of the whole distance was definitely located, and prepared for the contractors; the second division of sixteen miles more was examined instrumentally, with sufficient accuracy to determine the character of the route, and the comparative cost. The following is the estimate for the first thirty miles of the road, built substantially and of the best materials, and put in good working order:—

Graduation, drains, &c.....	\$19,900
Superstructure.....	160,349
Motive power and equipment.....	27,200
Depots, Engine House and tools.....	16,100
Engineering, Agencies and Contingencies.....	10,451
	\$234,000

being \$7,800 per mile.

The soil is a hard firm clay, mixed to some extent with sand, and will, it is believed, upon drainage, make a substantial track, as in that climate there will be no frost to contend with. The plan of superstructure estimated for is as follows:—A T rail of the best English iron, weighing 47 lbs. to the yard, laid upon post oak and red cedar cross-ties, 2,347 to the mile, and fastened with wrought iron chairs and hook-headed spikes of the best quality. Contracts have already been made for the rails, grading, and cross-ties for the first thirty miles, on favorable terms; and the directors express a confident expectation that twenty miles will be in running order by the middle of February next.

The grades on this road are extremely light, not exceeding ten feet per mile, and that only in one instance for less than half a mile, near Harrisburg. The route is also to a great extent free from curves. The eastern terminus of the road, Harrisburg, which is situated upon Buffalo Bayou, a stream always navigable to that point, is fifty miles by the bays of Galveston and San Jacinto, and twenty miles more by the Bayou, north-west from the city of Galveston, the principal seaport of the state; and is upon the direct line of communication from the seaboard to the interior and north-western portions of the state. Accompanying the report is an estimate of the probable business of the road for the first year, as follows:—

#### DOWN FREIGHT.

20,000 bales cotton at 75 cts.....	\$15,000
3,000 hhds. sugar, at \$1.50.....	4,500
4,000 barrels molasses, at 62½ cts. 2,500	
30,000 bushels corn at 5 cts.....	1,500
Miscellaneous freight.....	5,000
	\$38,500

#### UP FREIGHT.

100,000 bales and bls. merchandise, at 30 cts.....	\$30,000
20,000 bushels corn, at 5 cts.....	1,000
2,000 M. Lumber, at \$3.....	6,000
Miscellaneous.....	1,750
	\$38,750

Passengers both ways.....	12,500
Mails, &c. ....	1,000

Gross receipts.....\$80,750

These estimates are made, says the report, from the most reliable sources, and may be considered

as within the actual business which the road will secure. The soil is very fertile, and it is stated that one planter near the line of the road, sold, during the last year, 9,000 bushels of corn at over a dollar a bushel, in addition to 350 hhd. of sugar, and 600 bales of cotton, while there are numerous plantations equally productive although less extensive. Fort Bend and Wharton counties, including the Brazos Valley or bottom, extending from four to eight miles on each side of the stream, and through which the road will pass, contain some of the best cotton, sugar, and corn growing land in the country. Much of this land is, however, lying unimproved, by reason of the extreme difficulty and great expense and uncertainty attendant upon getting the produce to market. The immediate effect of a railroad through that section would be to develop to an immense extent these dormant resources, and pour wealth into the lap of those who reside in its neighborhood.

After paying the expenses of working the road, and interest on the stock, the amount of receipts above estimated would leave a handsome dividend to be divided among the stockholders; and with these facts in view, the enterprising planters will no doubt urge forward the work with commendable vigor.

## American Railroad Journal.

Saturday, July 26, 1851.

### Stock and Money Market.

Since our last report there has been an increased activity in the money market. Money is in active demand, and though in the regular channels of business it is sufficiently abundant, it is much more difficult of access for purposes of speculation. There is a pretty strong downward tendency on stocks, and the prospect is that fancies will rule low for some time to come. Railroad bonds are in pretty good demand, and are now become a favorite investment. Those of the first class find a pretty ready sale at fair prices.

The supply of money for the future, depends upon the extent of our shipments of specie. The rapid rate at which it has gone forward since the commencement of the year has created a good deal of alarm. In Boston and Philadelphia the markets are pressed. In Boston particularly so. In speaking of the state of matters, the *Journal* says:—

Money was in active request this morning for short loans. The whole market wears a decidedly stringent aspect, and the people seem thoroughly alarmed. It would, however, require but a slight improvement in the specie statistics, to create a quick reaction, and the movements of coin during the next two or three weeks will exert a powerful influence on the opinions of money operators. As long as uncertainty and distrust exist, there is a disposition to contract, even with the ability to extend, and money becomes stringent by anticipation, though actually in quite as good supply as during two months past.

In Providence money was in request at higher rates.

A sale of 600,000 Boston city 5 per cent. stocks have been made to a foreign house through Blake, Ward & Co., at or about par.

The Comptroller advertises that he will receive proposals until the 19th of August, for one million of canal revenue certificates. Proposals may be made for taking the whole sum, or any part thereof—not less than one thousand dollars—but no certificate will be issued under one hundred dollars. The money is required by the 23d August. The certificates will be made payable on the 1st day of

July, 1861, and will bear interest at the rate of six per cent. per annum, payable semi-annually, at the Manhattan Company in New York, or at the state bank in Albany.

The foreign iron market continues depressed. Rails may be quoted from £5 to £5 5s. 0d. Below will be found the weekly report of Wm. Bird & Co.

140 Buchanan Street, Glasgow, }  
June 28th, 1851.

The Pig Iron market continues quiet, and since our report of the 21st inst. we have heard of no transaction to any extent. In spite of the apparent languor, however, the consumption is greatly on the increase; and shipments which at the end of April were 50,000 tons in excess of corresponding months of last year, now show an increase of upwards of 70,000 tons.

For speculative purchases, the market has afforded for some time no margin,—hence in some measure, the dull tone; but the stocks in commission hands, coupled with the regular and increasing demand, lead us to believe that the opportunity for buying cheaply has not been wholly neglected by those who require pig iron for their own use.

Prices during the past week has undergone no change, though makers rates are somewhat easier.

Our quotations are as follows:—

	Mixed		
	No. 1.	Nos.	No. 3.
	s. d.	s. d.	s. d.
*G.M.B. ....	39 6	39 6	39 3 f.o.b Glasgow.
Gartsherrie ....	41 3	41	40 6 "
Langloan ....	39 9	39 6	39 3 "
Forth ....	43	42 6	42 " Charlestown.
Kinneil ....	42 6	42 3	42 " Bo'ness
Eglinton and			
Glegarnock. 40 6	40	39 9	" Ardrossan.

"Gartsherrie" delivered f.o.b. East Coast at 1s. 6d. per ton addl. Other brands 2s. 6d. per ton.

Manufactured iron unaltered, with little demand,

Bar Iron.—"Monkland" and similar quality	£5 5 0	} per ton, f.o.b. Glasgow usual discount.
"Dundee" do	5 5 0	
"Govan" do	5 12 6	
Sheet and Plates .....	7 10	
Hoops .....	7 10	
Nail Rods .....	6 5	

\* "Good Merchantable Brands."  
† "Free on Board."

The Petersburg Railroad Company have declared a semi-annual dividend of 3½ per cent. Stockholders on the Philadelphia list will receive their dividends at the bank of Pennsylvania.

The following half yearly dividends have been declared upon some of the Massachusetts railroads, viz:—*Old Colony* 2 per cent.; *Passumpsic* 3; *Fall River* 3; *Boston and Worcester* 3½; *Fitchburg* 4; *Boston, Concord and Montreal* 6 per cent, dividend of interest in stock.

The following are the receipts of the Hudson and Berkshire Railroad for the month of June,—

Receipts to 30th June, 1851 ..... \$26,488  
Same time 1850 ..... 17,475

Increase, over 50 per cent. .... \$9,013

The earnings of the Ogdensburg Railroad for the month of June, 1851, were:—

Through freight going East .....	\$8,222 78
Way " " West .....	1,929 79
" " " East .....	7,208 10
" " " West .....	1,884 89

Total freight ..... \$19,844 56  
Passengers ..... 8,256 23  
Miscellaneous ..... 2,056 00

Total earnings ..... \$30,158 79

Michigan Central Railroad.—The following table exhibits the aggregate receipts and expenditure for the year ending May 31, 1850:—

	1851.	1850.
For passengers .....	\$505,964 31	\$375,695 98
For freight .....	412,262 50	279,056 13
Miscellaneous .....	48,777 75	44,124 61

\$967,104 56 \$698,876 12

Expenses, exclusive of interest, but including the cost of replacing the depot and cars destroyed by fire .....

400,839 86 301,649 13

Leaving net income .... \$566,264 70 \$397,226 99

The surplus from last year was \$18,061 77, leaving income and interest fund \$584,326 47. Paid interest, \$277,460 64. Dividend 9 per cent. cash declared Dec., 1850, \$230,544, leaving present balance of interest account, \$76,312.544, leaving \$76,312 83.

Whole number of passengers for the year ending May 31, 1850, was 152,671; from that date to May 31, 1851, was 191,851.

Morris Canal.—The receipts of the first two weeks of July were \$7,912 70, an increase of \$955 74 over last year.

Pennsylvania Canals.—The following statement shows the amount of tolls received upon the Pennsylvania state works up to the 1st of July, which, as compared with last year, shows an increase of upwards of \$75,000:—

December to July ..... \$967,433 76  
Same period last year ..... 891,973 55

Increase in 1851 ..... \$75,460 21

Kennebec and Portland Railroad.—Receipts for the first four months in 1851, \$21,371 11; same month in 1850, \$14,885 68; increase, \$6,485 43. The account for May will also show a handsome gain over the same month last year.

Rochester and Syracuse Railroad.—The receipts of this road for June, 1851, fare two cents per mile, amount to ..... \$98,320  
The receipts for the same month last year, fare three cents per mile, were ..... 84,030

Increase in June, 1851 ..... 14,290

The Erie railroad is opened through from New York to Lake Erie, and doing large business; but the above statement shows that the competition has not injured the business of the Central Line, and is a conclusive argument in favor of cheap fare, which, like cheap postage yields the largest revenue.

Southern Michigan Railroad.—The traffic on this road has been good, and the returns made by the officers show a large gain. The earnings for the month of June, 1851 and 1850, were:—

June 1851 ..... \$22,322 58  
June, 1850 ..... 8,349 47

Increase ..... \$13,973 16

The aggregate for the last six months ..... 112,774 46  
Same time 1850 ..... 34,707 55

Increase ..... \$87,066 89

The Evening Journal gives the annexed statement of the quantity of flour, wheat, corn and barley, left at tide water during the 2d week in July, in the years 1850 and 1851, as follows:

	Flour.	Wheat.	Corn.	Barley.
	bbls.	bush.	bush.	bush.
1850 ....	24,598	10,665	35,958	9,850
1851 ....	68,105	90,508	322,879	880

Increase 43,507 80,443 286,921 dec. 8,970

The aggregate quantity of the same articles left at tide water from the commencement of navigation to the 14th July, inclusive, during the years 1850 and 1851, is as follows:



	Flour. bbls.	Wheat. bush.	Corn. bush.	Barley. bush.
1850...	694,546	258,307	1,507,378	126,801
1851...	277,793	669,377	3,503,864	104,631

Inc.... 582,347 411,070 1,996,486 dec.22,170

The aggregate quantity of the same articles left at tide water from the commencement of navigation to the 14th July, inclusive, during the years 1849 and 1851, is as follows:

	Flour. bbls.	Wheat. bush.	Corn. bush.	Barley. bush.
1849....	950,116	643,615	2,750,576	96,826
1851....	1,277,893	669,377	3,503,864	104,631

Increase. 327,777 25,762 753,288 7,805

By reducing the wheat to flour, the quantity of the latter left at tide water this year, compared with the corresponding period of last year, shows an increase of 664,561 bbls. of flour.

The amount received for tolls on all the New York State Canals during the 2d week in July, is.....\$85,686 50  
Same period in 1850..... 66,750 68

Increase in 1851.....\$18,935 82

The aggregate amount received for tolls from the commencement of navigation to the 14th of July inclusive, is.....\$1,297,834 18  
Same period in 1850..... 1,059,413 58

Increase in 1851.....\$238,420 60

## Railway Share & Stock List;

CORRECTED WEEKLY FOR THE  
AMERICAN RAILROAD JOURNAL.

NEW YORK JULY 26, 1851.

### GOVERNMENT AND STATE SECURITIES.

U. S. 5's, 1853.....	101½
U. S. 6's, 1856.....	106½
U. S. 6's, 1862.....	111
U. S. 6's, 1862—coupon.....	113a114
U. S. 6's, 1867.....	116½
U. S. 6's, 1868.....	116½
U. S. 6's, 1868—coupon.....	121½
Land Warrants.....	140a145
Arkansas 6's.....	52a53
Alabama 5's.....	91a92
Indiana 5's.....	82a83
Illinois 6's, 1870.....	65a68
Kentucky 6's, 1871.....	109a110
Massachusetts sterling 5's.....	105a106
Massachusetts 5's, 1859.....	100½
Maine 6's, 1855.....	103
Maryland 6's.....	102½
Michigan.....	—
Mississippi.....	—
New York 6's, 1865.....	117a118
Ohio 6's, 1860.....	108
Pennsylvania 5's.....	90½a91

### RAILROAD BONDS.

Atlantic and St. Lawrence, 6 per cent.....	85
Baltimore and Ohio, 1857.....	95
Boston and Providence 6's, 1855.....	101
Boston and Worcester 6's, 1855, convertible.....	107½
Bost., Concord and Mont. 6's, 1860, mortgage.....	87½
Cheshire 6's, 1860.....	91½
Connecticut River 6's, convertible.....	98
Erie 7's, 1859.....	103
Erie 7's, 1868.....	109½
Erie income 7's.....	98
Hudson River 7's, 1853.....	106½
Michigan Central, convertible, 8's, 1856.....	104½
New York and New Haven.....	100½
Norwich and Worcester, mortgage, 1860.....	80a85
Old Colony, 1854.....	97½
Ogdensburg 7's, 1859.....	97
Portsmouth and Concord.....	80a85
Passumpsic 6's, 1859.....	94½
Rutland 7's, 1863.....	97
Reading mortgage, 1860.....	80
Reading mortgage, 1870.....	75
Sullivan, mortgage 6's, 1855.....	80
Vermont Central 6's, 1852.....	96½
" " 6's, 1856.....	91½
Vermont and Massachusetts 6's, 1855.....	86½

### RAILROAD STOCKS.

[CORRECTED FOR WEDNESDAY OF EACH WEEK.]

	July 23.	July 16.
Albany and Schenectady.....	96½	—
Atlantic and St. Lawrence.....	55a60	—
Androscoggin and Kennebec.....	40a45	—
Boston and Maine.....	103½	103½
Boston and Lowell.....	110	—
Boston and Worcester.....	104	103½
Boston and Providence.....	88a89	90
Bost., Concord and Montreal.....	40	—
Baltimore and Ohio.....	75½	—
Baltimore and Susquehanna.....	34	—
Cheshire.....	54½	—
Cleveland and Columbus.....	—	—
Columbus and Xenia.....	—	—
Camden and Amboy.....	—	—
Connecticut River.....	68a70	—
Delaware and Hudson (canal).....	—	—
Eastern.....	98	98
Erie.....	83½	84½
Fall River.....	95	—
Georgia.....	—	—
Georgia Central.....	—	—
Harlem.....	73½	73½
Hartford and New Haven.....	126½	—
Housatonic (preferred).....	52	—
Hudson River.....	75	—
Kennebec and Portland.....	50a55	—
Little Miami.....	—	—
Long Island.....	16½	17½
Mad River.....	—	—
Madison and Indianapolis.....	96	—
Michigan Central.....	103½	103½
Montgomery and West Point.....	—	—
Michigan Southern.....	—	—
Manchester and Lawrence.....	95½	—
Morris (canal).....	16	16½
New York and New Haven.....	114	—
New Jersey.....	133	—
Norfolk.....	69	—
Nashua and Lowell.....	107½	—
New Bedford and Taunton.....	111	—
Norwich and Worcester.....	56½	56
Norfolk County.....	18a20	—
Ogdensburg.....	35½	36
Old Colony.....	67½	67½
Passumpsic.....	80	—
Pennsylvania.....	—	—
Pittsfield and North Adams.....	95	—
Philadelphia, Wilm'gton & Balt.....	29½	29½
Petersburg.....	—	—
Richmond and Fredericksburg.....	—	—
Richmond and Petersburg.....	—	—
Reading.....	56	56
Rochester and Syracuse.....	115	—
Rutland.....	53	53
Stonington.....	44	44½
South Carolina.....	—	—
Syracuse and Utica.....	130	—
Sullivan.....	15a18	—
Taunton Branch.....	110	—
Troy and Greenbush.....	90	—
Tonawanda.....	—	—
Utica and Schenectady.....	130	—
Vermont and Canada.....	103	—
Vermont Central.....	35	35
Vermont and Massachusetts.....	29	30½
Virginia Central.....	—	—
Western.....	102½	103
Wilmington and Raleigh.....	—	—
York and Cumberland (Pa.).....	22	—

### The St. John New Brunswick.

This paper finds fault with our review of Mr. Howe's railroad speeches, and says they are written by a gentleman connected with the European and North American railroad. There is not the remotest foundation for this statement. The person alluded to has neither written, nor suggested the writing of a leading article for this paper for a year past, nor even a line for many months. We might with equal truth say that he writes the leading articles for the New Brunswick.

The editor of that paper, instead of disproving any of our positions, merely echoes some of our statements, and stands with mouth open, and hand raised, in mute astonishment at what we have said,

If the Editor does not agree with us, let him show in what we are wrong; and to give him something better to do than sneering, will he please tell us how much it will cost per ton to transport produce from Toronto to Halifax, over the Quebec railroad when built? Will he also give us the figures to prove Mr. Howe's assertion that the produce of Upper Canada will take the above route for shipment? Mr. Howe takes the affirmative. We claim that it will cost \$16 per ton to send over this route, when at the same time freight can be forwarded from Toronto, via New York, for one half that sum. If Mr. Howe is incorrect, it impugns either his motives, or his knowledge upon the subject of transportation by railroad—the latter of course. Mr. Howe's speeches are excellent specimens of popular speaking; but he cuts a ridiculous figure when he assumes to be authority upon subjects of railroading.

### Railroad Furnishing Store.

A new railroad furnishing store has recently been opened in this city, by Bridges & Brother (late of the firm of Davenport & Bridges, of Cambridge Mass.) where almost every article used in the equipment of roads may be found. Mr. Bridges has had a long experience in the practical department of car and locomotive manufacture; and for this reason can more easily meet the wants of companies,—who will find at their store, at No. 64 Cortland St., every article and of good quality, that comes within the circle of their wants.

### A New Locomotive Establishment.

Messrs. Smith and Perkins, of Alexandria, Virginia, have commenced the manufacture of Locomotives upon a pretty extended scale. They now employ about 150 hands, and are now manufacturing at the rate of about twenty locomotives a year. Mr. Perkins was for many years superintendent of machinery and repairs upon the Baltimore and Ohio railroad; and has long enjoyed the reputation of being one of the most skillful and practicable mechanics in the country. There is probably no person among us better capable of constructing a good engine, or a better judge of work. The above establishment is now engaged in filling orders for the Orange and Alexandria and the Manassas Gap railroads, terminating in Alexandria.

The above establishment is one of the beneficial results of the railroad movement in Virginia. But for railroads in that State, it never would have existed. The railroad is the pioneer, and where they are constructed a thousand branches of industry follow in their train. They create a demand for labor to construct and maintain them, and by opening up a market to every article of use or consumption, stimulate every kind of industry. As the South is behind the North in the manufacturing establishments, we hope to see them give a liberal patronage to their own works, a course which will be of mutual benefit to all parties.

### Kentucky.

**Louisville and Frankfort Railroad.**—The third annual report of the directors of this company contains a very satisfactory statement of the condition of the road. On the 1st of June, 1850, the road was completed and in operation to Lagrange, a distance of twenty-six miles; and since that time it has been completed from Lagrange to Frankfort, 38 miles. Trains now run regularly twice a day in each direction along the whole length of the road.

The subscription of the city of Louisville amounts to \$800,000, for which there has been issued to her 15,983 shares of stock, of which she has transferred

9,648 shares to individual tax-payers, leaving 6,335 shares to her credit on the books of the company. The tax of one per cent. per annum on the citizens of Louisville was very closely collected.

Since the 1st of June, 1850, contracts were made for laying the track east of Consolation, and for a wire suspension bridge over the Kentucky river, at a cost of \$27,000.

The company now own the entire square bounded by Jefferson, Brook, Green and Floyd streets, and are erecting a substantial depot on it, 200 by 84 feet.

From the report of the chief engineer, Mr. C. N. Warren, we learn that for most of the past year two daily trains have been running which more than paid their expenses, besides supplying the necessary materials for the track.

The grade of the road stood the past winter very well, with the exception of a few embankments that required widening and raising. The receipts for the year, chiefly for way business, amounted to \$10,263 80, while the running expenses were \$23,730 03, leaving a profit of \$16,533 77, which was applied to the construction of the road.

The stock of the company now consists of three locomotives, four first class passenger cars, two second class passenger cars, twelve covered and twenty-four open freight, and twelve gravel and dirt cars. Contracts have been entered into for three more locomotives, two of which are now due and one will be in August. One is on the way from Pittsburgh.

The company has the contract for carrying the mails between Louisville and Frankfort. This contract has just gone into operation.

The effects of the road on the value of real estate were not overrated. All along its entire length, the value of lands has been increased, and in many places it has been doubled. The effect on the prosperity of the cities at each end of the route has also been highly favorable.

#### Railroad from Pittsburgh to Wheeling.

The Pittsburgh people are somewhat stirred up by the Hempfield railroad project, which threatens to cut them off from the direct route from Philadelphia to Central Ohio. To avoid the effect of this road, if built, they propose to build a road direct to Steubenville, and from thence to Bridgeport, opposite Wheeling, and they claim that the latter city can be reached from Philadelphia via Pittsburgh by as short a route as by the Hempfield railroad. The Pittsburgh Gazette, speaking of this route, says:

1. It is as direct. The railroad distance from Wheeling to Greensburg has been variously estimated at from 80 to 90 miles. From the difficult nature of the country, we may take the latter as the true figure, or say 91 miles to Bridgeport, opposite Wheeling, which will be the terminus of the Western and Southern roads, in the direction of Wheeling, and the true point of divergence and competition. The Steubenville route figures up thus:

Greensburg to Pittsburgh.....	31 miles,
Pittsburgh to Steubenville.....	40 "
Steubenville to Bridgeport.....	20 "

Total..... 91 "

Making the distance by both routes the same, and intercepting the trade and travel before it reaches the stations of the Baltimore road in Wheeling.

2. It is cheaper. The Hempfield will be a very expensive road. It crosses two large navigable rivers, and tunnels five hills, and the whole 90 miles would have to be built. By the Steubenville route, only 60 miles of additional road would require to be built, and twenty of that could be very cheaply constructed.

3. It is more economical for Philadelphia, as she

would thus use the whole of her road, instead of turning trade off of 31 miles of it; and the Steubenville road will pay much better, as it will pass through a large city, giving it a large local trade.

From this examination it will be seen that Philadelphia can accomplish her object of attracting the Cincinnati, Belpre and Marietta road to Wheeling, and of enjoying its trade and travel, together with that of the Ohio Central railroad, better by assisting to build the Pittsburgh and Steubenville road, than by throwing her aid to the Hempfield project. There is no doubt also that the Cincinnati, Belpre and Marietta company would like this arrangement much better, as it would give them just as direct a road with the east, besides opening up to them the trade of this city.

#### New Hampshire.

*Sullivan Railroad.*—From the annual report of the directors of this company, submitted to a meeting of the stockholders recently, we learn that the receipts of the road during the year ending July 1st, 1851, have been \$26,959 40 over the expenditures. The balance of stock has been subscribed, and the requisite steps taken to relieve the stockholders from the individual liability. The branch and bridge across the Connecticut river at Bellows Falls are nearly completed. The prospects of the road are represented as very favorable for its future business.

The following gentlemen were chosen Directors for the ensuing year, viz:—Charles Thompson, Charlestown, Mass.; George Denny, Boston, Mass.; Jonas Livingston, Claremont; Aurelius Dickenson, Claremont; J. B. Upham, Boston; Henry Hubbard, jr., Charlestown, N. H. and J. M. Glidden, Charlestown, N. H.

The Board of Directors, at a meeting holden July 15th, 1851, re-elected Hon. Charles Thompson, President; D. A. Gage, Superintendent; George Denny, Esq., Treasurer; P. C. Freeman, Esq., Clerk.

#### Indiana.

A large meeting of the citizens of Dearborn, Decatur, Ripley and Shelby counties, interested in the Lawrenceburg and Upper Mississippi railroad, was held in Greensburg on the 4th instant, James Elliott, Esq., of Shelbyville, presiding. The meeting was addressed by Hon. George H. Dunn, President of the above road, and others; and a confident expectation was expressed that at no distant day the cars would be running between Lawrenceburg and Greensburg. Letters were read from Gov. Wright, Albert S. White, President of the Lafayette and Indianapolis railroad company, Henry B. Hill, President of the Shelbyville and Knightstown railroad company, and other gentlemen, expressing their entire sympathy with the railroad enterprise, which the meeting was endeavoring to promote. Mr. White stated that the next 4th of July would witness the completion of the road from Lafayette to Indianapolis, and that then, or very soon after, the entire route would be completed between Lafayette and Lawrenceburg.

#### Mississippi.

*New Orleans and Jackson Railway.*—A meeting was held in Aberdeen, Mississippi, on the 4th June, to consider the practicability of a railroad to Jackson, to connect at that point with the New Orleans and Jackson Railroad. There seemed to have been considerable enthusiasm. A committee was appointed to prepare an address to the people of New Orleans, Jackson and Vicksburg, uniting their co-operation, and recommending energetic action. Chancellor Coker was appointed to represent Aberdeen in the convention to be held in Jackson on the first Monday of this month.

#### New York.

*Rochester and Syracuse Railroad.*—We learn from the Albany Journal that, at a meeting of the Directors on the 4th of June last, it was resolved to create new or additional stock to the amount of fifteen hundred thousand dollars, to be divided into shares of one hundred dollars each, and the same to be distributed *pro rata* as near as may be, among the respective shareholders of this company, according to the number of full shares held by them on the 21st of July next, who shall on the first day of August next, or within twenty days thereafter, pay to the Treasurer of this company the sum of ten dollars on each share of additional stock to which they may be severally entitled. The certificates for shares are to be issued on the payment of the said sum of ten dollars per share, on condition that the balance of the stock shall be paid in such installments as may be required by the Directors, and that on failure to pay any such instalment, all the stock so in arrear, shall be forfeited to the use of the company. Interest is to be semi-annually paid to the holders of the new stock on all sums paid thereon, until the said stock shall be made full.

#### Canada.

*Bytown and Prescott Railroad.*—At a meeting of the stockholders of this company, held at Bytown on the 21st of May, the directors submitted a report of their proceedings for the four months previous. On assuming the duties of directors, in January last, they engaged the services of Walter Shanly, Esq., as Chief Engineer, and directed him to proceed with the examination of several routes, and report thereon as soon as practicable. The examinations were accordingly made, with as much expedition as circumstances permitted at that season of the year, and completed about the middle of April. A meeting of the directors was held at Prescott on the 17th of April, at which Mr. Shanly's report was received. The directors also definitely located the line of the road from the St. Lawrence river, at Prescott, to the Ottawa river, at Bytown, by way of Kemptville, and keeping on the east side of the Rideau river. The amount of stock subscribed, and now available, exceeds £52,000, showing an increase of £24,000 since the month of January. The expenditure thus far has been confined almost entirely to the survey, and amounts to £105. If the work be pushed with energy, the directors say the road may be in operation before the close of 1852.

The officers for the present year are:—John McKinnon, Esq., President; Alfred Hooker, Esq., Vice-President; Robert Bell, Secretary.

John McKinnon, Joseph Aumond, Charles Sparrow, Daniel McLachlin, Nicholas Sparks, John Egan, John S. Archibald, Joseph Bower, Alfred Hooker, Thomas Creighton, John Moran, Alpheus Jones and William Patrick, Directors.

#### Illinois.

*Springfield and Bloomington Railroad.*—The route for this road is now under survey. A branch is to be built from Bloomington to Peoria, to connect with the Peoria and Oquawka railroad. At Bloomington the road is to connect with the Illinois Central, in case the last named route passes through that town; if not, by a branch.

The above road is a continuation of the Alton and Sagamon railroad, which is soon to be completed to Springfield, and will probably be constructed by the same company. It is claimed that at its junction with the Central, it will become the trunk line for the travel of the latter to St. Louis and the Mississippi river.



**Routes Across the Isthmus of Panama.**

We learn from a friend who has just returned from the Isthmus, that the new boat, recently placed upon the Chagres river, is navigating that stream very successfully. It is called the Aspinwall, and runs between Chagres and Gorgona and Cruces and is capable of carrying from 200 to 300 passengers. Her construction is a novelty; she has a stern wheel, from 15 to 18 feet in diameter; her hull is 110 to 125 feet long, and from 20 to 25 feet wide, with a main, promenade and hurricane deck; she has a double engine of 125 horse power; her bottom is entirely flat, and without any keel and she draws but 15 to 20 inches of water. She carries on her bow an oar about 25 feet long to assist in steering. She makes her passages in from eight to ten hours. Her passengers are well protected from the rain, which commences in May, and continues through December.

Gorgona and Cruces are from 50 to 60 miles by the river, from Chagres, and only about 20 from Panama. Between Gorgona and Panama, the land route is travelled by mules only.

The Panama railroad company, says our informant, are expecting soon to have their road completed from Navy Bay to Gatun, a point on the Chagres river, about ten miles from Chagres. Passengers from the ocean steamers will then land at Navy Bay instead of Chagres, and go over the railroad to Gatun, and thence by steamer to Gorgona. From this place they will continue to travel on mules to Panama, until the road is completed from ocean to ocean.

The route by way of Nicaragua, is soon to be tested. Mr. Vanderbilt, we understand, is about placing some small steamers upon the river and the lake. The distance by steamers will be about 180 miles, and thence by land from 12 to 15 miles to the Pacific ocean. Whether his small steamers will be able to stem the Rapids on the San Juan river, will soon be determined by actual experiment. This route will shorten the distance over the Panama route some five or six hundred miles, on the Pacific side, but will be more than double the distance across the Isthmus.

The Tehuantepec route is yet full of difficulties, but when established, it will shorten the distance from New York to San Francisco near 1800 miles; and from New Orleans to San Francisco near 2,500 miles. The government of Mexico have annulled the grant to Garay; but the company at New Orleans, who hold under him, appear to be determined to push forward their enterprise in defiance of the opposition of the Mexican government.

**Massachusetts.**

**Taunton Branch Railroad.**—At a meeting of stockholders of the Taunton Branch Railroad, in Taunton on the 30th ult., the following persons were chosen Directors for the ensuing year:—William A. Crocker, Thomas B. Wales, Samuel Frothingham, John F. Loring, and Fitzhenry Homer. At a subsequent meeting of Directors, W. A. Crocker, Esq., was re-chosen President, Edward Pickering, Treasurer, and A. E. Swasey, Superintendent.

**North Carolina Railroad.**

The following gentlemen have been chosen directors of the road for the present year:—

William C. Means, of Cabarrus; John W. Ellis, and D. A. Davis of Rowan; Francis Fries, of Forsythe; John W. Thomas, of Davidson; John M. Morehead, and John A. Gilmer, of Guilford; Cad. Jones, Sen., of Orange; Edwin M. Holt, of Alamance; R. M. Saunders, of Wake; A. T. Jenkins, of Craven; Frederick J. Hill, of Brunswick.

**Philadelphia, Baltimore and New York.**

There seems likely to be a very spirited contest between Philadelphia and Baltimore, in their efforts to form advantageous connexions to secure western trade. We think it must result in the speedy completion of the Hempfield and the Pittsburgh lines.

Each of the above cities is amply able to execute any projects that look to their present or future welfare, and they will probably move in a much more efficient manner with the stimulus of rival interests than without such. Pittsburgh too, feeling slighted, perhaps unjustly treated, by the aid that Philadelphia is extending to the Hempfield route, now proposes to open a communication with the Baltimore and Ohio railroad, near Cumberland, which can very easily be effected. Such a connection would be of great benefit both to Pittsburg and Baltimore, and would bring the former on the direct line between the latter and the great lakes.

Philadelphia and Baltimore expect a very large increase of business upon the completion of their respective lines of railway. Each of them counts upon monopolizing, by virtue of their superior positions, a large part of the western trade. In the mean time our own state is watching the progress of her rivals with great attention, and is doing all in her power to retain her supremacy. Our canals are speedily to be enlarged to their utmost capacity, and all restrictions upon the carriage of freight by railroads have been removed. All idea of protecting the business of the canals by imposing taxes upon railroads, has been abandoned, and nothing has been left undone to reduce the cost of transportation upon our own highways. New York, Philadelphia and Baltimore are about to start upon a new race for western trade, the possession of which is equivalent to commercial supremacy.

**Canada.**

It is stated that the Champlain and St. Lawrence railroad company will have their line completed, from St. John's to Rouse's point in the course of the present month, the contractor being now actively engaged in laying down the rails. This will give the city of Montreal an uninterrupted communication by railway, with Boston and New York.

**Ohio.**

**Cleveland and Pittsburgh Railroad.**—This road continues to do a very large business. During the first week in July 7,000 persons passed over the road; on the fourth of July, 3,800. The receipts on the 3d, 4th, and 5th, were over nineteen hundred dollars. On the 4th alone over \$1,000. This is doing remarkably well for a road that is only partially opened, and shows what may be expected when the road reaches the Ohio.

**Mad River Railroad.**—The T. rail is now being put down daily on the Mad River road. About thirty-five miles of the road are in readiness for the new iron.

**Jeffersonville Railroad.**

A vote is to be taken at Louisville on Saturday the 23d of August, on the question of a subscription by the city of a million of dollars to the Louisville and Nashville railroad, and \$200,000 to the Jefferson and Columbus railroad.

**Indiana.**

The New Albany Ledger states that the President of the New Albany and Salem railroad company had sold \$100,000 of the 10 per cent. bonds of the company to Englishmen at 10 per cent. premium. The cars will be running from Albany to Orleans on or before the first of September.

**The Golden Gate.**

This splendid new steam-ship, which was built by W. H. Webb for Messrs. Howland and Aspinwall's Pacific mail steamship line, made a trial trip last week as far as Chesapeake Bay, returning on Thursday evening after a varied and pleasant voyage. The Tribune describes this vessel as one of the finest steamers ever built. Her length on deck is 270 feet; her breadth of beam 40 feet, and her depth of hold, 30½ feet. Her engines are built on the oscillating principle, and are eighty-five inches in diameter, with nine feet stroke. The cylinders, instead of being stationary, as the other form of engines, are constructed in such a manner that the cylinders vibrate on trunnions, similar to that of a gun, the upper end of the piston rod being directly connected with the crank which turns the shaft, the movement of the cylinder allowing the piston rod to follow the circular motion of the crank. These engines are the largest ever made on this plan. The trunnions are cast solid with the cylinders, and are made hollow, so as to allow the steam to pass in at one end and escape through the other into the condenser. The pumps are driven by the connecting shaft, which is made with a crank forged solid in the centre of it, of such a size as to give the air pumps four feet stroke. There is a separate condenser to each engine rendering them perfectly distinct, so that one may be worked entirely independent of the other. The valves of the cylinders through which the steam passes, instead of being of the ordinary sliding form, are those known as the conical balanced valves, similar to those used on stationary cylinders in engines of American construction. This improvement enables one man to work one of those monstrous engines with as much ease as six men could work one with the old slide valves. When standing on the pilot-house, but for the noise of the wheels, it is almost impossible to tell whether the engines are working or not. The great advantage of engines on this principle is the great economy of space and weight in the ship, as they do not occupy more than half the room of side-lever engines of the same size, nor are they more than two-thirds their weight. The entire length of these engines is only eighteen feet. They were built at the Novelty Works of Messrs. Stillman, Allen & Co., and the plans were drawn and arranged by Thomas Davison. They were completed in eight months, the shortest time engines of this size were ever made in.

**Michigan.**

**Michigan Southern Railroad.**—We learn from the South Bend Register that the cars have reached White Pigeon, which is within thirty-five miles of South Bend. The company has perfected a permanent arrangement by which the steamers Baltic and Saratoga are to make daily trips between Monroe and Dunkirk. Passengers will be taken from Monroe to New York in forty-one hours. We learn also from the same paper that eight new locomotives and one hundred and forty-five new cars are to be placed upon the southern road immediately.

**Michigan Central Railroad.**—We learn from the Michigan City News of the 11th inst., that the contracts on the Central road from that place to the Illinois line have been let during the present week. T. Martin, Esq., of Michigan city, has taken the contract for half the distance, and Messrs. Williamson and Tilotson, of Marshall, have taken most of the other half. It is thought the grading will be completed by the 1st of October.

**Dayton and Michigan Railway.**

The Dayton and Michigan railway company was duly organized under the charter on the 8th instant, at Troy. Thomas J. S. Smith, of Dayton; Thomas J. Line, of Tippecanoe; William Barbee, John G. Telford, H. S. Mayo, and Joseph Brown, of Troy; and Dr. William Fielding, of Sidney, were elected directors by the stockholders. The board of directors was then organized, and elected William Barbee President, H. L. Mayo, Treasurer, and Joseph Brown, Secretary. \$83,400 of unrestricted stock had been already subscribed.

The Troy Times, in speaking of the above project, says:—

"Whoever has surveyed the Miami Basin in its length and breadth, now the most productive portion of the continent, will accord to us truth when we say that a line of railroad, belting its whole length, draining it of its immense productions, and in turn ministering to its wants and consumption, would have no superior in any of the proposed railroads, running either north and south or east and west.

The efficiency of the board of directors is such as to give satisfaction to the friends of the measure here at home, and to give confidence to the friends abroad.

We hazard the opinion that the newly constituted board, so far as it relates to energy, ability and efficiency, could not be surpassed by any among us, or about us."

**Canada.**

**Great Western Railroad.**—The directors of the Michigan Central railroad have issued a circular to the Stockholders, proposing that they shall subscribe to the stock of the Great Western Company, equal to six per cent. on their interest in the former company. The circular states that most of the large stockholders have signified their acquiescence in the proposition. It is understood that the subscription is not to be called for, unless, in the opinion of the committee appointed at Niagara Falls, at the convention in May last, such an amount is subscribed by American stockholders as will secure the prompt completion; and provided further, that a satisfactory arrangement shall be made in regard to the management of the road.—*Albany Journal.*

**Railroad Meeting at Pittsburgh.**

The citizens of Pittsburgh held a meeting on the 12th inst., called in consequence of the recent movement in Philadelphia in favor of the Hempfield railroad, which if it is made, is to cut Pittsburgh off in the passage between Philadelphia and the great West. It was deemed by the meeting that the best means of avoiding any such threatened evils was to push vigorously the road from Pittsburgh to Steubenville. The following resolutions were adopted:—

Resolved, That the project recently entertained in Philadelphia, and sustained by the managing directors of the Pennsylvania railroad company, involving a virtual abandonment of a part of the Pennsylvania railroad, by an attempt to concentrate at Wheeling, Virginia, all the trade, travel, and resources of the Ohio—of the West, South and South-west—is a project founded in an entire ignorance of the true condition of things in this region of country, and would (if it could be carried out) prove fatal to the best interests of Philadelphia, as well as wrongful and highly injurious to Pittsburgh, to Western Pennsylvania, and to the whole state.

Resolved, That the extravagance of such a project persisted in, as we understand it is, and will be, demands at our hands a prompt and decided exposure; and that for this purpose, a committee of five be appointed by the President, to proceed to Philadelphia, where it finds favor and support, to expose the true character of the scheme, and to present the merit and pretensions of the Pittsburgh and Steubenville railroad, as the means which will secure, in reality, all, and more than all, the blessings so deceitfully promised by the scheme referred to.

Resolved, That as the officers and managing directors of the Pennsylvania railroad company have, by their recent action in Philadelphia, attempted to sustain the wrongful and injurious project to which we have referred, and are now, as we are informed, engaged in furthering it, it becomes the duty of the commissioners of Allegheny county, from which the said company have obtained a million of dollars to join us in sending representatives from said county to Philadelphia, for the purpose mentioned in the foregoing resolutions; and that the attention of said Commissioners and of the people of our county should be earnestly directed to the proceedings of said company, with a view to secure a faithful performance of its obligations, and to prevent an improper application of the stock, credit, and influence of said company, to the construction of other roads injurious to our county and to the whole state.

Some of the speakers urged that in addition to the Steubenville road, the people of Pittsburgh ought to direct their attention, at the earliest practicable moment, to the completion of the Connells-ville railroad, by which a connexion would be formed with Baltimore.

The meeting adjourned to Saturday 19th inst., when the committee appointed to visit Philadelphia were to report.

**Baltimore and Ohio Railroad.**

The following table will show the gross revenue of the Baltimore and Ohio Railroad, for the last six months, compared with the corresponding six months of 1850:—

	1850.	
	Main Stem.	Washington Branch.
January,		
Passengers .....	\$24,828.89	\$18,009.17
Freight .....	66,517.89	3,888.97
February,		
Passengers .....	29,090.34	19,523.29
Freight .....	75,630.01	3,925.68
March,		
Passengers .....	44,271.15	25,953.72
Freight .....	81,747.03	7,235.00
April,		
Passengers .....	35,574.85	21,945.65
Freight .....	68,677.94	3,941.06
May,		
Passengers .....	33,177.36	24,543.72
Freight .....	72,840.39	4,240.69
June,		
Passengers .....	29,768.15	21,168.03
Freight .....	82,484.20	6,027.59
	\$644,608.13	\$160,422.57
	160,422.57	
Revenue .....	\$805,030.70	

	1851.	
	Main stem.	Washington branch.
January,		
Passengers .....	\$25,298.63	\$20,140.18
Freight .....	90,450.07	4,607.14
February,		
Passengers .....	27,567.98	22,048.59
Freight .....	90,402.11	4,236.80
March,		
Passengers .....	33,635.14	22,645.68
Freight .....	84,353.74	7,158.39
April,		
Passengers .....	29,503.96	20,675.60
Freight .....	71,035.03	4,093.24
May,		
Passengers .....	25,589.32	19,146.54
Freight .....	66,638.87	3,863.12
June,		
Passengers .....	25,086.78	17,906.02
Freight .....	85,768.19	5,875.54
	\$655,329.82	\$152,398.84
	152,398.84	
Revenue .....	\$807,728.66	
	805,030.70	
Increase in 1851 .....	\$2,697.96	

The revenue of 1850 was greatly larger than in 1849, and the fact that there is an increase in this year over that of 1850, is a most gratifying evidence of the prosperity of the road, and of the already large and rapidly increasing trade of the country through which it passes.

It will be noted that the increase is on the main stem, while the revenue of the branch to Washington has fallen off this year. This is, of course, owing entirely to the fact that Congress adjourned last March, while it was in session in 1850 up to the fall. The falling off is then entirely from the natural decrease of travel to and from Washington. This circumstance would also necessarily affect the travel over the main stem, and yet the revenue from it is larger this year than last.

In the above table we have included only returns from the six months of this year. The fiscal year of the company commences in October, when the annual report is made, and as we have the figures before us, we add the comparative statement for October, November, and December, of the years 1849 and 1850. They are as follows:—

	1849.	1850.
Main Stem .....	371,645 33	369,805 06
Washington Branch ....	70,396 60	78,453 68
	442,041 93	448,258 74
		442,041 93

Increase .....

" in 1851 .....

6,216 81

2,697 96

Total increase .....

8,914 87

Thus it is seen that in the nine months ending on the 30th June, 1851, there has been an increase of revenue over the corresponding months of 1849 '50, of nearly nine thousand dollars.—*Baltimore Patriot.*

**Result of the Opening of the South Carolina and Georgia Railways upon the Cotton Trade.**

The tabular statements accompanying De Bow's Commercial Review for May, show that for the last three years the exports of cotton have diminished from New Orleans more than 12 per cent., and have increased from the port of Charleston nearly 13 per cent. The increase at Charleston, and the decrease at New Orleans was largest in the year 1850, after the opening of the railway to Chattanooga, evidently showing the capacity of railways to draw the heavy trade from the irregular navigation of the smaller rivers of the west. The results will be probably, equally significant when the large tributaries of the Mississippi shall be reached by railway from the South.

The decrease at New Orleans in 1849 and 1850 was from 1,191,000 to 797,000 bales; while the increase at Charleston during the same time was from 261,000 to 384,000 bales. This embraces a period of depression in production, and of accident to the railway, suspending its operations for two months.—*Louisville Courier.*

**Railroad Movements in the West**

An active competition is going on among the towns below us on the river, to draw from Cincinnati the trade of the fertile State of Indiana, and to secure it to themselves. Their united efforts are of course directed to divert this trade from us, however they may disagree in the distribution of it.

Louisville and Jeffersonville, in the direction of Indianapolis represent one interest, New Albany another, Madison still another, and more powerful interest. The road from Jeffersonville to Columbus is nearly ready for the cars. The certainty of the completion of this rival road, has stimulated Madison to more vigorous exertions to prevent the trade of the rich counties of Shelby, Rush, &c., from being diverted to Louisville. As a means of preventing this, the city council of Madison have appointed a committee, consisting of Messrs. Sullivan, White, Stapp and Farnsworth, to negotiate for the purchase by the city of the railway from Edinburgh to Shelbyville. This will give the Madison and Indianapolis railroad the control of the Rushville and Knightstown branches; the three making an aggregate of nearly 50 miles of railroad.

The Louisville Courier says: "It will not do for



our citizens to remain listless while neighboring cities are active and awake to their interests.—Louisville should have the control of the roads beyond Columbus, as in this way only can our merchants trade with the people of that section on anything like fair and equal terms. Let us, by a well directed policy, secure a trade of almost incalculable magnitude, and a trade too with which we have heretofore been entirely unacquainted, and which has been enjoyed exclusively by Cincinnati and Madison. Few of our readers have an adequate conception of the beauty, fertility and productiveness of that portion of Indiana with which the Jefferson railway will bring us into connection, and now that the vast trade of this rich region is within our grasp, we must not by inaction permit it to be wrested from us. A bright future is before Louisville if she is only true to herself."

And what will be the future of Cincinnati, if she sleeps on and lets this vast trade go into other markets?—*Cincinnati Gazette.*

#### Extension of the Baltimore and Ohio Railroad West.

This day marks another epoch in the Baltimore and Ohio Railroad. To-day it will be finally opened from Cumberland to a point some thirty miles west of that city, and thus be brought into closer proximity with the coal mines in that region.

The progress of improvement has been so fast of late, that few can or do take notes of events as they pass. It will surprise many, who look only at what has been done, to be told that the Baltimore and Ohio railroad was the pioneer of all railroads in the United States, and that when it was commenced, no similar work of such a magnitude was ever projected in the world. And even more striking is the fact—when we look upon what has been done in the interval,—that the first train of passenger cars in the United States was put in motion December 28th, 1829, upon the Baltimore and Ohio railway, which was opened on that day to Ellicott's Mills, a distance of thirteen miles from Baltimore. At long intervals, the road was opened to Frederick, then the branch road to Washington city—then the main road to Hancock, and then, so many years ago we will not attempt to recollect the exact time, it was opened to Cumberland.—Here it stopped ever since—now trying to get Virginia to give it a proper right of way to the Ohio river; and again holding back, because Pennsylvania was not inclined to give it a free passage through her territory. At length Virginia granted terms which the company, for want of better, was obliged to accept, and the work of making the road to the Ohio river at Wheeling, was commenced with vigor. From the day that the first shovel of earth was removed on the line of the road west of Cumberland, it is only just to say that every officer of the company, the president, the chief engineer, and all the others, have shown an energy and an ability, and have persevered in the work with such admirable success, that the day of its completion to Wheeling as fixed by them, is regarded by every body, who has looked into the matter, as a "fixed fact," upon which all reliance may be made.—*Baltimore Patriot, July 21.*

#### Railroad from Wilmington to Petersburg.

We are willing to venture the broad assertion, that our railroads from Wilmington to Petersburg, are equal to any in the country (or will be when the entire line is relaid with T and U iron, of which only a comparatively small portion remains to be done; and our cars are not surpassed by any, either North or South, for beauty, comfort and convenience. The locomotives are nearly all entirely new and are under the control of experienced engineers, while the conductors will compare favorably with the same number of gentlemen anywhere and occupying any position. The Petersburg road is paying a dividend of 8 per cent., and if the Wilmington road would fund her debt as the boasted South Carolina road has done, ere long she too would be paying handsome dividends.

We are willing to put our officers, roads, cars—all, against any road in the United States, and are fully satisfied they would not suffer by the comparison. By the way, the Petersburg company have recently put on another new and most superb sleeping car, built at their Depot.—*Weldon Patriot*

#### Louisville, Kentucky.

The Cincinnati Gazette, in speaking of the influence that railroads are beginning to exert upon that city, says:

Louisville appears to be reaping the reward of her energy and liberality in giving such strong and liberal aid at once to the internal improvement enterprises which centre there. The railroad to Lexington is now a pleasant route, and the distance is run in a few hours. From Madison and from Jeffersonville into Indiana, the cars are daily arriving and departing with freight and passengers—and these roads are steadily extending. The effect in Louisville is very sensible, and a visit there a few days past presented a very different appearance of business and success, than we ever remember to have seen. The streets and landing were thronged with business men and vehicles. The city has throughout, every appearance of progress. New buildings are erecting in every direction, and appear to be demanded. We saw "To Let," but seldom. The hotels are crowded with guests.—We attribute much of this increasing prosperity arising from the awakening of the citizens of Louisville, to the advantages of internal improvement, and the natural effects resulting from those already done. We look for still greater results to her, when her Indiana roads are more extended, and her Nashville road, to which she has subscribed a million of dollars, is opened. Louisville has built, whilst Cincinnati has been building. We say to Cincinnati merchants and mechanics—Look Out.

#### New York.

*Northern Railroad.*—We are gratified to learn says the Albany Evening Journal, that the directors of this company have resolved to put the two first sections of this road (extending to Cohoes) under contract, and that the advertisement for proposals for the work will be made in a few days.

#### Hartford, Providence and Fishkill Railroad.

The receipts of this road for the five months ending June 1, 1851, show an increase of 33 per cent. over the corresponding period last year. The receipts for the month of June show a gain of about forty-one per cent. over the same month last year. The gain on passengers would have been larger had the arrangements been completed for a connection with the Stonington road by a steamboat between New London and Stonington. This was done last summer, and formed a very pleasant route to Hartford. A new and fine boat has been built for the purpose of this connection, and has commenced running within a few days.—*Providence Journal.*

#### The Suffolk Bank.

The Boston Traveller of Saturday says:—The country money received at the Suffolk bank counter during the last six months, was 120 millions of dollars, or about \$770,000 per day, viz:—

Month of January, 1851.	\$20,763,000
" February, "	16,084,000
" March, "	18,218,000
" April, "	21,400,000
" May, "	23,100,000
" June, "	20,600,000

Total for six months.....\$120,165,000

#### T. Perkins, Esq.

This gentleman, who has been connected with the department of machinery of the Baltimore and Ohio railroad since 1837, and a portion of the time as master of machinery, has resigned his position and become connected with Mr. R. C. Smith of Alexandria, Va. The new firm have already contracted, on favorable terms, to build the greater part of the machinery and equipment for the Orange and Alexandria railroad. We regard Mr. Perkins as the first locomotive builder in this country, and challenge contradiction from any quarter whatever, holding ourselves in readiness to submit the proofs. Mr. Smith has obtained in him an invaluable accession. While we regret his loss to the Baltimore and Ohio railroad company, we know no place where we had rather see him settle than in the old town of Alexandria.—*Cumberland Citizen,*

#### Orange and Alexandria Railroad.

Our readers will learn with pleasure, that the Orange and Alexandria railroad company, have contracted, on favorable terms, to have the greater part of the machinery and equipment, already ordered for their road, built by Messrs. Smith & Perkins, in this town.

In the well established reputation of the Messrs. Smith, the company have a guaranty for the quality of the materials and workmanship, while the great experience of Mr. Thatcher Perkins, in this branch of business, will secure machinery of the greatest efficiency and economy, combining the latest improvements.

The position of Mr. Perkins as master of machinery, on the Baltimore and Ohio railroad, with which he had been connected since the year 1837, is well known; and his reputation as a builder of locomotives, is second to none in this country. With a locomotive manufactory of the first character, under such auspices, on this part of the Southern frontier, we may anticipate great advantages to the business of this town.

The economical working of the Baltimore and Ohio railroad, has, for some years past, elicited the praise of those best qualified to judge of such matters, and no small share of the credit is due to the able management and judicious improvements, introduced by Mr. Perkins, into his department.—*Alexandria Gazette.*

#### Notice to Contractors.

##### Steubenville and Indiana Railroad.

**PROPOSALS** will be received at the Office of the Steubenville and Indiana railroad company in Steubenville, until the first day of October next, for the Grading and Masonry of the first division of the road extending from Steubenville to the Connott valley and also for the construction of the entire road between Steubenville and Coshocton; and also distinct proposals for the construction of that portion of the road extending from Coshocton to Newark.

The entire length of this line is about 110 miles, and it contains work of all descriptions, in great variety, some of which is quite heavy.

Proposals will be received for the Grading and Masonry of the first division entire or in sections of about a mile each, the Company reserving the privilege to make such disposition of the whole work, as may appear most conducive to its interests.

Plans, profiles and specifications can be seen at the office of the Company after the 15th of September, and further information may be obtained on application to J. Blickensderfer, jr., Chief Engineer, or to the undersigned,

D. KILGORE, President.

#### To Contractors.

**SEALED** proposals will be received until the 31st inst., for the construction of the first two divisions of the Albany Northern railroad (about 94 miles). The maps, profiles, specifications, &c., can be seen at the office of the Engineer, 514 Broadway, Albany.

W. G. BULLIONS,  
Chief Engineer.

#### Virginia Locomotive Car Works.

Wolfe Street and River Potomac, Alexandria, Va.  
**SMITH & PERKINS, Proprietors.**

##### MANUFACTURE

Locomotive Engines and Tenders.  
Marine and Stationary Engines and Boilers.  
Chilled Car Wheels and Axles.  
Patent Chilled and Wrought Slip-tire.  
Machinery and Castings generally.

The undersigned having erected very extensive shops, and procured the most modern machinery and tools, are prepared to execute orders for Locomotive Engines, Cars, and Machinery of all kinds, with despatch, and on the most favorable terms.

R. C. SMITH,

Late of the Alexandria Iron Works.

THATCHER PERKINS,

Late Master of Machinery on the Balt. & O. R.R.

July 23, 1851.

**Bridges & Brother,**  
DEALERS IN  
RAILROAD AND CAR FINDINGS,  
64 Courtlandt street, New York.

Having established a general Depot for the sale of articles used in the construction of Railroads, Locomotive Engines and Railroad Cars, we would invite your attention to our establishment. We have already in store a good assortment of CAR FINDINGS and other articles used in the trade, and feel justified in saying, that should you desire anything in our line, we can supply on terms perfectly satisfactory, and in the event of your desiring to order, you may feel assured that your terms will be as good as though you were here to make your own purchases.

Among our goods may be found Railroad Car Wheels, Axles, Jaws and Boxes, Nuts and Washers, Bolts, Brass Seat Hooks and Rivets, Window and Blind Springs, Lifters and Catchers, Door Locks, Knobs and Butts, Ventilators and Rings, Car Lamps, Coach and Wood Screws, Jack and Bed Screws and Babbitt's Metal; also Plushes, Damask, Enameled Head Linings, Cotton Duck for Top Covering in width sufficient without seams, Curled Hair and all other articles appertaining to cars.

Also a new and valuable CAR DOOR LOCK, well adapted to the Sliding Door. This is decidedly the best yet introduced.

LOCOMOTIVE ENGINE LANTERNS, the best article made in the country. Whistles, Gauge and Oil Cocks, Hemp Packing, American, Russian and Italian. We are also agents for Lightner's Patent Journal Box for Car Axles, that invaluable invention, for the economical use and preservation of Car Journals.

Coach VARNISH and Japan of the best quality. We would also offer our services for the purchase as well as for the sale of goods on commission.—Both members of our firm have had the experience of many years in the manufacture of Railroad Cars, and our Senior was a member of the well known house of DAVENPORT & BRIDGES, Car Manufacturers, Cambridgeport, Mass. With our knowledge of matters pertaining to Railroads, we feel quite confident in giving satisfaction to both buyer and seller, and hope that through assiduity and attention to any business entrusted to our care we shall merit a continuance of confidence and patronage.

BRIDGES & BROTHER.

July 22, 1851.

**Lightner's Patent Axle Boxes.**

THE Undersigned are Agents for, and offer for sale, *Lightner's Patent Axle Boxes*, for Railroad Cars and Tenders, which have, by thorough experience, been demonstrated to be one of the most valuable improvements ever introduced in Locomotion. The saving effected in oil alone, will in a few months pay the first cost of these boxes, independent of other advantages. They are now in use upon the following, among other roads, viz:

Boston and Worcester, Boston and Providence, Boston and Fitchburg, Nashua and Lowell, Providence and Worcester, Northern, N.H., Cheshire, Manchester and Lawrence, Concord, N.H., Concord and Claremont, Ogdensburg, (Northern, N.Y.) Stonington, New London Willimantic and Palmer, New Jersey Central, New Hampshire Central, Worcester and Nashua, Fitchburg and Worcester, Connecticut and Passumpsic, Lowell and Lawrence, Salem and Lowell, Wilton Branch, Newburyport.

Below will be found the certificates of a number of gentlemen, whose opinions will be good authority in every part of the country.

Office Boston and Prov. R. R., }  
Boston, Dec. 28, 1849. }

Mr. JOHN LIGHTNER,

Sir,—It affords me pleasure to say, that after two years' trial of your boxes, I am fully and entirely satisfied of their superiority over any other pattern we have used. This superiority consists in economy of oil and freedom from "heating." I have tried every pattern of box in use, of any note, and do not hesitate to say, that you have devised one which in every respect combines greater advantages than any other within my knowledge; these advantages are so manifest, that I am fitting up all

our cars with your boxes, as fast as practicable.

Annexed, is a statement of an experiment with your boxes, the result of which may be of use to your interests.

Ten passenger cars, running 72 wheels, fitted up with Lightner's boxes used 41½ pints of Patent Oil, at 50 cts. per gallon, ran 43,099 miles, equal to 5.16 pints per wheel for 43,099 miles. Speed, 30 to 40 miles per hour.

Very respectfully yours,  
W. RAYMOND LEE, Supt.

I have examined the above statement of Mr. Lee, and fully concur with him in his opinion of the superiority of Lightner's box.

GEORGE S. GRIGGS,  
Supt. Machine Shop B. & P. R. R.

Boston, July 26, 1849.

This is to certify that J. Lightner's axle boxes for railroad cars and locomotive tenders, have been in use on the Boston and Worcester railroad one year, and I unhesitatingly pronounce it, in my opinion, the best and most economical one in use, requiring less oil, of easy application, not susceptible of derangement, as in most kinds in use. When requiring repairs or renewal, the same may be done in one-fourth of the time usually occupied for that purpose. The box requires oiling not oftener than once a month—is kept quite free from dust, and consequently wears much longer than those generally in use.

D. N. PICKERING,  
Supt. Motive Power, B. & W. R. R.

Office of Boston Locomotive Works, }  
December 12th, 1849. }

The Boston Locomotive Company have been using J. Lightner's patent axle boxes under the tenders of their engines for several months, and find them more highly spoken of by the railroad companies that have used them in regard to economy in the use of oil, their durability and their ease of adjustment, than any other boxes which they have used. We therefore do not hesitate to recommend them to all railroad companies.

DANIEL F. CHILD,  
Treas. Boston Locomotive Works.

Taunton Locomotive Works, }  
Taunton, July 7, 1849. }

Mr. H. F. ALEXANDER,

Dear Sir,—Your favor of yesterday came to hand in which you ask what success we have met with, in using Mr. Lightner's patent box for cars, engines, &c.

We have put it in use on the Boston and Providence railroad, New Bedford and Taunton Branch railroad, Central railroad, N. J., Norfolk County, Rutland and Burlington, and as yet we have not had one complaint from them; and from what we have used of it, and witnessed, we do not hesitate to say that it is superior to anything in use for that purpose. It is simple in its construction, and easy of access, and the reservoir is held close to the shaft, and the oil and journal is perfectly secure from dust; they will run from four to six weeks without replenishing the oil. The brass in the box is changed very much easier than by any other plan that we have seen.

Very resp. yours,  
W. W. FAIRBANKS, Agent.

Office Providence & Worcester R. R. Co., }  
Providence, Dec. 17th, 1850. }

H. F. ALEXANDER, Esq.,

Sir,—The "Lightner patent boxes" for cars and locomotives have been in use under a portion of the passenger cars and engines of this company for upwards of two years, and have given very great satisfaction.

Though combining many excellent qualities, their great superiority consists in the economy of oil.

The result of experiments upon this road shows the consumption of oil by the use of this box, to be not more than one sixth part the quantity consumed by the use of the common box.

With the common box, eight passenger cars, 64 wheels, running 90 miles per day, consumed in 12 months 520 gallons of oil, being an average of 8½ gallon per wheel per annum.

With the Lightner box the same cars running the same number of miles per day, during the same space of time consumed 73½ gallons of oil, being an average of 1½ gallon per wheel per annum.

So manifest are its advantages over any other box used by this company, it is intended to place it under all our cars as soon as practicable.

Besides the saving of oil, as they afford complete security from dust, we think them more durable than any other box in use.

Another advantage resulting from the use of this box is, cars run more easier than with the common box. The saving in fuel which it would effect, would of itself, we think be a sufficient inducement to use this box in preference to any other known to us.

Very respectfully,  
ISAAC H. SOUTHWICK, Supt.  
JOHN B. WINSLOW,  
Supt. Machine Shop, P. & W. R. R.

Cambridgeport, April 5th, 1851.

H. F. ALEXANDER, Esq.

Sir,—This may certify that I have been engaged in the manufacture of railway cars since 1834, and have built for the different railroad companies cars of all descriptions to the amount of three millions of dollars, and have used on the above cars all kinds of journal boxes, and find that none give better satisfaction than the "Lightner patent box," both on account of the saving of oil and the arrangement for taking out and re-placing the composition by means of the sliding key, and other conveniences which no other box possesses.

Yours respectfully,  
CHARLES DAVENPORT.

Worcester, March 17th, 1851.

H. F. ALEXANDER, Esq.

Dear Sir,—This is to certify that I have been for some years past engaged in building cars, and that I have tried most, if not all of the patent boxes, and have found Lightner's patent superior to all others as far as the saving of oil is concerned, also the ease with which they are fitted and exchanged in case they get out of order.

For the last three years, I have put them under all of the cars I have built, and in every instance they have given the most entire satisfaction.

Yours truly,  
OSGOOD BRADLEY.

Office Union Works, So. Boston, }  
May 23d, 1851. }

This certifies that I have applied Mr. J. Lightner's patent axle boxes to my locomotives and tenders for the past two years. I consider them superior to all others,—economical in their use, and possessing many important advantages not found in any other boxes.

SETH WILMARTH.

Office 15, R. R. Exchange, Boston, }  
June 1, 1851. }

This is to certify, that we have known the success of Lightner's patent journal boxes upon various roads in New England the past three years, and have been led to examine their peculiar construction.—We are well satisfied of their merits, and have adopted them upon our small gravel cars, and take pleasure, as we ever have done, in recommending their use upon all roads where we are employed in the construction.

GILMORE & CARPENTER,  
Contractors.

Amoskeag Manufacturing Co. Machine Shop, }  
Manchester, May 31, 1851. }

H. F. ALEXANDER, Esq.

Dear Sir,—We are using the Lightner box on all the engines and tenders we build, and we are satisfied that it is the best box in use, and recommend the same to all those who purchase engines at our works.

Yours respectfully,  
O. W. BAYLEY, Agt.

This is to certify that the Fitchburg railroad company having become satisfied of the superiority of J. Lightner's patent Axle Boxes for Railway Cars and Locomotive Tenders adopted the same,



and are bringing them into general use upon their road.

One year's experience with the above improvement, has fully convinced me that there has never been anything offered to the public for that purpose which possess such intrinsic value; in fact, this is an improvement which seems to overcome all the difficulties found in all the various kinds now in use. It possesses very many advantages over all others: Some of which are [first] the first cost is much less than that of most boxes in use. [Secondly] 75 per cent is saved in oil; one gill applied to each Journal once a month, or one quart to an eight wheel car, is all these boxes require per month [Thirdly] no dust can gain access to the Journal, which is constantly lubricated with clean oil; hence the saving in repairs of Journals and composition bearings, is a matter of importance. [Fourthly,] its construction is truly simple—not complicated, having nothing liable to become loose by constant and severe service. [Fifthly] for convenience there is nothing which approaches this improvement.—The composition bearings may be removed from the Journals of an eight wheel car, by one man, and returned, or duplicates, in twenty minutes, while under the car: the same would require two men, at least half a day with other boxes in use.—The trucks and wheels using these boxes, are free from oil and dirt, usually seen upon all railroad cars, at great expense to the corporation.

NATH'L JACKSON.

Supt. Car Building and Repairs, F.R.R. Co.

Boston, March 9, 1849.

I hereby certify, that I have examined a box for Car Journals, invented by Mr. Lightner of Roxbury, Mass, and I have thought so well of it that I have adopted it on our railroad, I have known of its success on other roads.

S. M. FELTON,  
Supt. F. R. R.

Office of the Central R. R., N. J., }  
Elizabethtown, May 1849. }

H. F. ALEXANDER, Esq.,

Dear Sir:—Your favor, [wishing to be informed how we liked Lightner's patent axle boxes for R.R. Journals,] has been duly received; in answer we would say, we have used the boxes on Locomotive tenders one year, more or less,—and on our cars some six months. I consider them the best boxes in every respect, I have ever used, or even seen used on any other roads—for safety, durability and the economy pertaining to all the details connected with the boxes and Journals of R. R. Car wheels; and we shall adopt them upon this road.

Yours Respectfully,

JOHN O. STEARNS.

Supt. Central Railroad Co., N. J.

Manchester, N. H., Nov. }  
1st, 1850. }

H. F. Alexander, Sir,

I have used "Lightner's Boxes" under all the Cars of the Manchester and Lawrence railroad, and feel no hesitation in saying that I think them to be the best boxes now in use.

Yours, &c.,

THEODORE ATKINSON, Agent.

Cheshire R. R. Office, Keene, }  
March 5th, 1851. }

Mr. H. F. Alexander,

Sir,—Lightner's Patent Boxes have been used on the Cheshire R. R. about a year, and have given the highest degree of satisfaction.

All the Passenger Cars now in use, and a considerable number of Merchandize Cars are furnished with them, and they will take the place of the Common Boxes on all the cars as fast as circumstances will permit.

Very Resp't.

L. TILTON,

Supt. Cheshire R. R.

Boston and Worcester Railroad, }  
Boston, April 1st, 1851. }

H. F. Alexander, Esq.,

Dear Sir,—Lightner's Patent oil saving box for railroad cars, has been adopted by this corporation; we are taking out the common and substituting the

Lightner's at the rate of fifty boxes per month; it will soon take the place of all others, as it is decidedly preferable to any heretofore used by this corporation.

G. TWITCHELL, Supt.

Statement of amount of oil used on 32 8-wheel freight cars, on the Boston and Providence Railroad (with Lightner's Boxes) from March 10, 1849, to February 27, 1851, and upon 12 8-wheeled passenger cars from September 8, 1849, to February 27, 1851.

FREIGHT CARS.

Amount Oil.	No. months.	Amount Oil.	No. months.
1.—21 pts.	10	17.—23½ pts.	14
2.—19 " "	6	18.—23½ " "	11
3.—25 " "	13	19.—36 " "	21
4.—18 " "	7	20.—22 " "	10
5.—22 " "	12	21.—38½ " "	24
6.—24 " "	13	22.—29 " "	23
7.—20 " "	11	23.—35½ " "	23
8.—21 " "	11	24.—37½ " "	23
9.—23½ " "	10	25.—51 " "	23
10.—21 " "	9	26.—31½ " "	24
11.—20 " "	9	27.—28½ " "	23
12.—21½ " "	11	28.—36 " "	23
13.—19 " "	8	29.—50½ " "	24
14.—25½ " "	17	30.—50 " "	23
15.—20½ " "	10	31.—41 " "	23
16.—31 " "	18	32.—39½ " "	23

Total, 925½ pts. 510

PASSENGER CARS.

1.—19½ pts.	18	7.—30 pts.	18
2.—25½ " "	18	8.—25½ " "	18
3.—33½ " "	16	9.—29 " "	18
4.—19 " "	15	10.—46½ " "	17
5.—15 " "	15	11.—9 " "	9
6.—22 " "	18	12.—65½ " "	17

Total, 340 pts. 197

Averaging 1 4-5 pints of oil for freight, and 1 7-10 for passenger cars per month only!

All orders and enquiries promptly attended to.

BRIDGES & BROTHER,

No. 64 Courtlandt st., New York.

July 25, 1851.

To Boiler Makers, Engineers, etc., etc.

PATENT LAP-WELDED IRON TUBES,

Manufactured by the

BIRMINGHAM PATENT IRON TUBE CO.

UNDER

PROSSER'S PATENT,

from one and a quarter to eight inches in diameter.

These tubes are well known for their superiority over all other descriptions for Locomotive, Marine and other Steam Engine purposes, for which they are used very extensively in Great Britain and on the Continent of Europe.

For sale in quantities to suit purchasers, by

WILLIAM BIRD & CO.,

44 Wall st., New York.

July 26, 1851.

To Railroad Companies.

THE undersigned has discovered and patented an imperishable, cheap, and sufficiently elastic substance, to be introduced between the sill and rail, so that the stone sill can be used in place of the wooden sill: entirely overcoming that rigidity where the rail is laid directly on stone. Address

J. B. GRAY, Philadelphia.

July 10, 1851.

To Contractors.

Peru and Indianapolis Railroad.

PROPOSALS will be received at the office of the Peru and Indianapolis Railroad, in Noblesville, until the evening of the 13th of August next, for the Grading of the line of the above road from Noblesville to Peru, a distance of fifty miles. Also the masonry for Bridges over the Wabash, Big Pipe and White Rivers.

The proposals are to be addressed to W. J. HOLMAN, Esq., Chief Engineer, at the Company's Office, where plans and specifications of the work may be seen. Payments will be made monthly in cash, reserving 15 per cent. till the contracts are completed.

Indianapolis, July 13, 1851.

European and North American Railway.

THE undersigned, the three persons first named in the first section of an act passed by the Legislature of Maine, and approved the twentieth day of August last past, entitled "An Act to incorporate the European and North American Railway Company," and being specially authorised therefor in and by said act, hereby give public notice that, for the purpose of receiving subscriptions to the stock of said company, as established by the act aforesaid, according to the provisions thereof, not exceeding forty thousand shares, books of subscription will be opened under the direction of the undersigned, according to the regulations prescribed, at the time and places following, viz:—On Wednesday, the Twentieth day of August next;

At Calais, Maine, with Noah Smith, Jr., Esq.  
Eastport, do. " Col. Bion Bradbury, Esq.  
Machias, do. " Walker & O'Brien,  
Ellsworth, do. " Seth Tisdale, Esq.  
Oldtown, do. " Geo. P. Sewall, Esq.  
Bangor, do. " Geo. W. Pickering, Esq.  
Orono, do. " Hon. Israel Washburn, Jr.  
Waterville, do. " Hon. Timothy Bontelle,  
Brunswick, do. " Prof. William Smyth.  
Augusta, do. " B. A. G. Fuller, Esq.  
Belfast, do. " John Y. McClintock, Esq.  
Portland, do. " John B. Brown, Esq.  
Portsmouth, N.H. " Hon. I. Goodwin.  
Salem, Mass. " Stephen A. Chase, Esq.  
Boston, do. " Francis Skinner & Co.  
Lowell, do. " John Wright, Esq.  
Worcester, do. " Charles Washburn, Esq.  
Providence, R.I. " Billings Brastow, Esq.  
Hartford, Conn. " Hon. C. F. Pond.  
New Haven, do. " Allen Prescott, Esq.  
New York, N.Y. " R. & G. L. Schuyler, No. 2 Hanover street.

Said books will remain open for ten successive days at the places and with the persons aforesaid. Dated at Portland, this sixteenth day of June, A. D. 1851.

ELIJAH L. HAMLIN,  
ANSON G. CHANDLER,  
JOHN A. POOR.

Trautwine on R. R. Curves.

By JOHN C. TRAUTWINE, Civil Engineer, Philadelphia, Pa.

IN press, and will be published in a few days; accompanied by a Table of Natural Sines and Tangents to single minutes, by means of which all the necessary calculations may be performed in the field.

This little volume is intended as a field-book for assistants; and will be found extremely useful, as it contains full instructions, (with wood cuts) for laying out, and adjusting curves; with Tables of Angles, Ordinates, etc., for Curves varying from 13 miles, down to 146 feet Radius.

A portable Table of Natural Sines and Tangents to minutes, has for a long time been a desideratum among Engineers, independently of its use in laying out curves.

The volume is neatly got up in duodecimo; and handsomely bound in pocket-book form.

Sold by Wm. Hamilton, Actuary of the Franklin Institute, Philadelphia. Price \$1.

Also in press, and will be issued in a few weeks, "Trautwine's Method of Calculating Excavation and Embankment."

By this method, which is entirely new, (being now made known for the first time) the cubic contents are ascertained with great ease, and rapidly, by means of diagrams, and tables of level cuttings. Thin octavo; neatly half bound, \$1. For sale by Wm. Hamilton.

June 23, 1851.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

**TO CONTRACTORS.**

Engineer's Office, S. S. R. Road Co.  
Petersburg, Va., May 27, 1851.

**PROPOSALS** will be received at the Engineer's office, South Side Railroad, at Petersburg, Va., until the 31st of July next, for the construction of Appomattox Bridge, to be erected near Farmville.

The Bridge will be about 3000 feet long and 80 feet high; to consist of a wooden superstructure resting on abutments and piers.

The piers will be of brick or stone, to be determined after receiving the proposals.

Good brick earth can be obtained near the site of the Bridge.

The proposals may be made for the structure complete, or for the various items of work and materials, viz.: Masonry, furnishing Bricks or Timber; workmanship of laying Bricks and workmanship of superstructure.

Security will be required for the fulfilments of the contracts, and it will be necessary that each proposal be accompanied with a letter from a responsible person or persons, stating that they will become security.

C. O. SANFORD,

Ch. Engineer, S. Side R. Road.

**Notice to Contractors.**

Engineers Office, E. T. & V. R. R. Company,  
Greenville, E. T., June 5th, 1851.

**PROPOSALS** will be received until the 1st day of October next, for the Grading and Masonry of that part of the E. T. & V. Railroad between the Eastern terminus of said road at King's Meadow, and Rheatown, in Greene County, a distance of about forty-seven miles. A large amount of very heavy work, both in Grading as well as Masonry, will be found on this division, offering strong inducements to able Contractors.

Maps, Profiles, and Specifications can be seen at this Office, on and after the 20th of July next.

The Company reserve the right to reject all, or any proposals that they deem unsatisfactory.

Proposals should be directed to the Treasurer and Secretary of the E. T. & V. Railroad Company, Jonesborough, E. T.

LLOYD TILGHMAN,

Chief Engineer.

**Railroad Lanterns.**

**COPPER** and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,

No. 24 Commercial St. Boston.

August, 16, 1849.

6m33

**Railroad Iron.**

**THE** Subscribers, Agents for the Manufacturers, are prepared to contract for the delivery of Railroad iron at any port in the United States or Canada, or at a shipping port in Wales.

WAINWRIGHT & TAPPAN,

29 Central Wharf.

Boston, June 1, 1851.

**Bowling Tire Bars.**

40 Best Flange Bars 5 1/2 x 2 inches, 11 feet long.  
40 " " 5 1/2 x 2 " 7 feet 8 in. long.  
40 " Flat 6 x 2 " 11 feet long.  
40 " " 6 x 2 " 7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON,

45 Cliff street.

**To Railroad Companies,  
Machinists, Car Man-  
ufacturers, etc., etc.**

**CHARLES T. GILBERT,**

NO. 80 BROAD ST., NEW YORK,

**IS** prepared to contract for furnishing at manufacturer's prices—

Railroad iron,

Locomotive Engines,

Passenger and Freight Cars,

Car Wheels and Axles,

Chairs and Spikes.

Orders are invited, and all inquiries in relation to any of the above articles will receive immediate attention

**THE** Fourth Annual Exhibition of AMERICAN MANUFACTURES, by the MARYLAND INSTITUTE for the Promotion of the Mechanic Arts, will be opened in Baltimore on the 20th October, 1851.

The Exhibition will be held in the SPLENDID NEW HALL of the Institute, (fronting on Baltimore street) now being rapidly completed. Their edifice is centrally situated, chaste in its architecture, solid in its construction, and is by far the largest and most complete building in the United States, devoted to the Mechanic Arts. It may be added that this building is 355 feet long by 60 in breadth, with an average height of 68 feet, containing some twelve apartments, the largest of which is 255 feet by 60, and that the cost will be over \$70,000.

To this Exhibition, the Managers ask the attention of all engaged in industrial pursuits throughout the country, and cordially invite them to contribute specimens of their best productions for public inspection, and to compete for the prizes offered by the Institute. These prizes consist of GOLD and SILVER MEDALS, DIPLOMAS, etc., which were last year distributed as follows:—Gold Medals, 16; Silver ditto, 90; Diplomas, 60; besides 85 articles of Jewelry, etc., to ladies. Fair play will be scrupulously observed towards all, and every facility of Steam power, shafting, fixture, labor, &c., &c., will be amply provided free of expense. The machinery will be under a special superintendent, and a fine display of it is looked for. The last exhibition of the Institute was visited by more than 40,000 persons, and with their vastly improved accommodations and alterations, this number will be doubled at the coming display, embracing many Virginians, Pennsylvanians, and other strangers from the South and West.

Joshua Vansant, President.

Ed. Needles, } Vice Presidents.

F. A. Fisher, }

Samuel Sands, Rec. Sec'y.

Wm. Prescott Smith, Cor. Sec.

F. J. Clare, Treasurer.

**BOARD OF MANAGERS.**

Ross Winans,

P. S. Benson,

Josiah Reynolds,

Thomas Stowe,

Thos. J. Lovegrove,

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C. W. Bentley,

Geo. R. Dodge,

Saml. E. Rice,

John F. Meredith,

W. Abrahams,

Thos. Trimble,

Chas. Suter.

(The last nine in *Italics* are the Committee on Exhibition.)

The Hall will be opened for the reception of goods on MONDAY, 13th October; on the next Monday, 20th, at 7 P. M., the Exhibition will be formally opened to the public, and will positively close on Wednesday, 19th November. Articles for competition must be in the Hall by Thursday night, Oct. 16, unless delayed in shipment after starting in ample time.

Those who intend depositing, will give the Committee or the Agent, notice as early as possible, stating the nature of the goods, and probable amount of room required, to exhibit them to advantage.

Circulars, containing a view of the new Hall and the full regulations of the Committee, with special information, if required, may be had promptly, by addressing the undersigned, or the Institute's Agent, J. S. Selby, Baltimore, post-paid.

ADAM DENMEAD,

Chairman Com. on Exhibition for 1851.

**SUPERIOR BLACK WRITING & COPYING  
INK.**

**Jones' Empire Ink.**

87 Nassau st., Sun Building, New York city.

Net prices to the trade—

Quarts, per dozen, \$1 50 16 oz. per dozen, \$0 50  
Pints, " 1 00 4 " " 0 37 1/2  
8 ounces, " 0 62 1/2 2 " " 0 25

On draught per Gallon, 20 cents.

This is the best Ink manufactured, it flows freely, is a good copying ink, and will not mould, corrode, precipitate or decay. Orders for export, or home consumption, carefully and promptly attended to by

21st

THEODORE LENT.

**To Railroad Companies, etc.**

The undersigned has at last succeeded in constructing and securing by letters patent, a Spring Pad-lock which is secure, and cannot be knocked open with a stick, like other spring locks, and therefore particularly useful for locking Cars, and Switches, etc.

I also invite attention to an improved PATENT SPRING LOCK, for SLIDING Doors to Freight and Baggage Cars, now in use upon the Pennsylvania Central, Greenville and Columbia, S.C., Reading, Pa., and other Railroads.

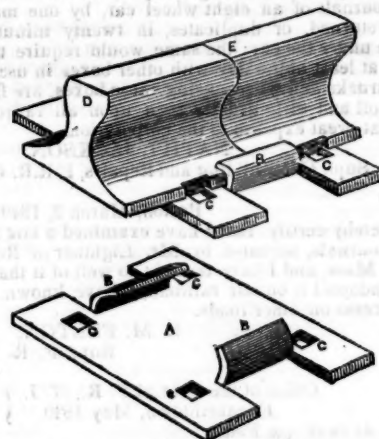
Companies that are in want of good Pad-lock, can have open samples sent them that they may examine and judge for themselves, by sending their address to

C. LIEBRICH,

46 South 8th St. Philadelphia.

May 9, 1851.

**The American Railroad Chair  
Manufacturing Co.**



**ARE** prepared to make WROUGHT IRON RAIL ROAD CHAIRS, of various sizes, at short notice.

By use of the WROUGHT IRON CHAIR, the necessity of the wedge is entirely done away—the lips of the chair being set, by means of a sledge or hammer, close and firmly to the flange of the rail.

The less thickness of metal necessary in the Wrought Iron Chair gives much greater power and force to the spikes when driven—and consequently a much less liability to the spreading of the rails by reason of the spikes drawing or becoming bent.

The less weight necessary in the Wrought Iron Chair, will enable us to furnish them at a cost much below that of CAST IRON CHAIRS.

**DESCRIPTION OF THE ABOVE CUTS.**

Figure 1 is a perspective view of the rail secured in the chair, and fig. 2 is a perspective view of the chair itself. D, E, are sections of two rails placed together, and secured at the joint on the chair by the jaws B, B. The chair is bolted down by spikes C, C. In fig. 2, the chair is represented as made of a single block or plate A of wrought iron.

The chair is set in its proper place on the track, spiked down, and the ends of the two rails brought together within the jaws as represented in fig. 1.

For further information address,

N. C. TROWERIDGE, Secretary,  
Poughkeepsie, N. Y.

June 1, 1851.

**Railroad Commission Agency.**

**THE** Subscriber offers his services to Railroad Co's and Car Makers for the purchase of equipment and furniture of roads and depots and all articles and materials required in the construction of cars, with cash or approved credit. No effort will be spared to select the best articles at the lowest market price.

He is sole Agent for the manufacture of the ENAMELED CAR LININGS, now in universal use. The best Artists are employed in designing new styles, and he will make to order pieces with appropriate designs for every part of the car, in all colors, or with silver grounds and bronzed or velvet figures.

He is also Agent for Page's Car Window Sash Fasteners, which is preferred by all who have used it to any other.

CHARLES STODDER,

75 Kilby st., Boston.

June 20, 1851.

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